ALLIANT ENERGY

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An Alliant Energy Company

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November 29, 2007

Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12.1
888 First Street, NE
Washington, DC 20426

In accordance with Article 404 of the Federal Energy Regulatory Commission (FERC) Order Issuing Original License (June 27, 2002) for the Prairie du Sac Hydroelectric Project, FERC Project No. 11162, WP&L was required to develop and implement a dissolved oxygen monitoring and enhancement plan for this facility. Historic water quality monitoring conducted by WP&L and the Wisconsin Department of Natural Resources (WDNR) indicated that at times dissolved oxygen concentrations may be lower than the 5 mg/L Water Quality Standard as specified under Wisconsin Administrative Code Chapter NR 102. Monitoring has shown that dissolved oxygen concentrations may be as low as 2 to 3 mg/L at the intake and in the tailrace during summer months. WP&L also previously investigated the use of turbine vacuum breakers to raise dissolved oxygen levels in the turbine discharge; however the results were reportedly inconclusive.

On behalf of WP&L, Natural Resources Consulting, Inc. (NRC) developed the dissolved oxygen monitoring and enhancement plan for the PDS facility, which was filed with FERC on March 27, 2003.
The *Order Approving Water Quality Monitoring Plan Under Article 404* (Order) was issued by FERC on September 11, 2003. The plan requires WP&L to monitor dissolved oxygen levels at their PDS facility during the summer low flow periods for a three-year period and re-evaluate the potential for vacuum breakers to increase dissolved oxygen levels in the tailrace. In 2004, the vacuum breakers were evaluated and proven to be ineffective at increasing dissolved oxygen concentrations ([DO]) in the tailrace, and therefore were not evaluated this year.

In 2006, NRC conducted the final year of the water quality investigation at the PDS facility according to the Order. In 2007, NRC continued the water quality investigation to provide an additional year of data to
support future efforts to increase DO concentrations in the tailrace. The attached report summarizes the methods and results of the 2007 investigation.

In 2007, Mead&Hunt reviewed methods used at various hydropower projects to increase dissolved oxygen in discharged flows and evaluated their applicability to the Prairie du Sac facility. This evaluation is summarized in the attached document. Based on the results of the evaluation, WP&L is planning to test the impact of spillway discharges on discharge DO in 2008. With that, WP&L will decide what would be the best action to implement as part of the operating procedures to maintain the DO levels under compliance.

If you have any questions you can reach me at 608-643-7710.

Sincerely,

Mildred Godoy
Hydro Manager

CC:
Louis Clemency – FWLS
Andy Morton - WDNR

Attachments:
Recommendations to Address Dissolved Oxygen Deficiency in Powerhouse Discharge – Mead&Hunt
Dissolved Oxygen Monitoring and Enhancement Plan – Natural Resources Consulting, Inc

September 11, 2007

Ms. Mildred Godoy-Daniels
Wisconsin Power and Light Company
S9270A Dam Road
Prairie du Sac, WI 53578-9712

Subject: Recommendations to Address Dissolved Oxygen Deficiency in Powerhouse Discharge

Dear Mildred:

We have reviewed the dissolved oxygen (DO) data provided by Wisconsin Power and Light Company (WPL) to evaluate how often concentrations below 5.0 mg/l occur, typical and extreme low DO conditions observed, and variation in DO readings throughout the water column. Between June 26 and September 30, 2006, there were 25 such occurrences, ranging from 0.1 to 4.8 mg/l. For 17 of the occurrences, the lowest DO reading was 3.0 mg/l or higher. Very low DO readings were typically associated with flows of about 2,000 to 3,000 cubic feet per second (cfs). Based on this review, we defined a “typical case” for mitigation evaluation as DO concentration of 3.0 mg/l and flow of 2,000 cfs.

We reviewed methods used at various hydropower projects to increase dissolved oxygen in discharged flows and evaluated their applicability to the Prairie du Sac facility. This evaluation is summarized in the following table:

**Evaluation of Dissolved Oxygen Mitigation Alternatives**

| Method | Advantages | Disadvantages | Costs | Applicability |
|---|---|---|---|---|
| Tailrace Submerged Diffusers: submerged air diffusers anchored in the tailrace fed by blowers located on the shore. | Oxygen transfer from diffusers is well established. Diffusers protected from upstream debris. | Inefficient oxygen transfer due to short hydraulic detention time and high velocities in tailrace. | High capital and operating cost due to inefficient oxygen transfer. | Not feasible unless a significant portion of the flow during low DO conditions is diverted to spill flows. |

| Method | Advantages | Disadvantages | Costs | Applicability |
|---|---|---|---|---|
| Tail Race Surface Mixers: aeration devices located on the water surface in the tailrace that mix atmospheric oxygen into the discharge. | Oxygen transfer from aeration devices is well established. Diffusers protect from upstream debris. | Inefficient oxygen transfer due to short hydraulic detention time and high velocities in tailrace. | High capital and operating cost due to inefficient oxygen transfer. | Not feasible unless a significant portion of the flow during low DO conditions is diverted to spill flows. Estimated equipment requirements for design conditions are 13-150 horsepower aerators. |
| Tailrace Weirs: structure built across the tailrace where the discharge cascades over and atmospheric oxygen transfers to the discharge. | Can produce large increases in DO where sufficient head drop is available. | Amount of DO increase is limited by the amount of head available. Oxygen input can not be varied independent of flow rate once constructed. | Capital cost can be high and operating cost is low. | Existing tailrace weir and rapids below currently act like tailrace weirs. Construction of weirs where rapids are currently located my improve aeration efficiency. |
| Turbine Venting: introduction of air into discharge downstream of turbines through vacuum breakers. | Uses existing or slightly modified equipment. | Amount of DO increase is limited. | Low capital cost and slight loss in power generating capacity. | This option has been tested and did not significantly increase the DO in the discharge. |
| Spill Flows: non-power release of water over spillways. | Uses existing or slightly modified equipment. | Amount of DO increase is limited and there is a loss of power generating capacity. | Low capital cost and some loss in power generating capacity. | This option may be effective on its own or in combination with other mitigation measures. |

| Method | Advantages | Disadvantages | Costs | Applicability |
|---|---|---|---|---|
| Reservoir Destratification: mixing water column in the reservoir with diffused aeration or mixers. | Technology is well established and may reduce release of nutrients from reservoir sediments. | Adverse effect on cold water fisheries due to mixing warm and cold waters. | High capital and operation costs. | This option is not likely to be effective as there is limited reservoir stratification and deficient DO conditions can occur through the entire water column at times. |
| Hypolimnion or Forebay Aeration: discharge of compressed air or pure oxygen into diffusers located in the reservoir. | Good for high-head, high hydraulic capacity, and large DO deficits. High oxygen transfer efficiencies. Size of the oxygen supply can be reduced if there is a stable hypolimnion to store DO. | Sizing system is difficult for run-of-river projects and where reservoir sediment oxygen demand is high. Diffused aeration systems in the forebay area would require lots of maintenance do to debris from upstream. | Moderate capital cost and high operation costs. | Limited effectiveness in this application because of the unstable reservoir stratification. Forebay aeration is estimated to require 700 brake horsepower to provide enough aeration for the design condition and the diffusers would be spread approximately 300 feet upstream of the generator intakes. |
| Selective Withdrawal: Modify the elevation of water withdrawal from reservoir. | Takes advantage of stratification in reservoirs with high DO in epilimnion. | May raise release water temperatures and is not effective for reservoirs with large water level fluctuations. | Capital cost can be high to modify existing systems. Operating costs are low. | This would be effective when DO levels are high in the epolimnetic waters of the reservoir but not when the entire water column is DO deficient. |

| Method | Advantages | Disadvantages | Costs | Applicability |
|---|---|---|---|---|
| Sidestream Aeration: divert a portion of the discharge flow to pure oxygen aeration. | Highly efficient use of oxygen. Ideal for run-of-river applications. | Limited experience for large scale applications. | Moderate capital and operating costs. | This system has flexibility to handle fluctuating needs for supplemental aeration and the hydraulic constraints of the project. |

The most promising approach appears to be a combination of some of these methods. The modification to the bar racks currently under design will raise the withdrawal elevation from the reservoir. This will raise the average DO in the discharge as the DO is generally higher in the epolimnetic waters in the reservoir but will not eliminate discharges with DO concentrations below 5.0 mg/l. Construction of a series of weirs downstream of the existing tailrace weir could also improve the DO in the discharge. There is approximately 6 feet of head drop in 200 feet of river downstream from the tailrace weir. Spill flows of water through the spill way may also be effective in mitigating DO deficiencies in the discharge water. The highly turbulent flow through the tainter gates and over the spillway will provide significant aeration to the spilled discharge water. Sidestream aeration with pure oxygen appears to be the most effective mechanical method to provide DO to the discharge. This system would withdrawal water from the tailrace pool and dissolve pure oxygen into it. The oxygen rich water would then be returned to the discharge. The amount of oxygen delivered could be varied based on the discharge flow rate and DO oxygen monitoring data upstream and downstream of the facility. Oxygen for the system could be delivered by vendors in rented storage tanks or generated on site. The cost effectiveness of generating the oxygen on site would depend on energy costs and the amount used annually.

To further evaluate the effectiveness of these methods for the Prairie du Sac facility, we recommend testing the impact of spillway discharges on discharge DO. This is potentially the lowest cost option to meet the DO mitigation requirements. Further investigation of the costs and effectiveness of sidestream aeration and construction of additional tailrace weirs for aeration should also be done to develop construction and operation costs.

If you have any questions or require additional information, please contact me.

Sincerely,

MEAD & HUNT, Inc.

Timothy J. Astfalk

# DISSOLVED OXYGEN MONITORING AND ENHANCEMENT PLAN

## PRAIRIE DU SAC HYDROELECTRIC PROJECT

## FERC Project No. 11162

## PRAIRIE DU SAC, WISCONSIN

**November 20, 2007**

NRC Project # 007-0076-01

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# DISSOLVED OXYGEN MONITORING AND ENHANCEMENT PLAN

## PRAIRIE DU SAC HYDROELECTRIC PROJECT
## FERC Project No. 11162

## PRAIRIE DU SAC, WISCONSIN

**November 20, 2007**

*Prepared For:*

Ms. Mildred Godoy-Daniels
Wisconsin Power & Light Company
S9270A Dam Road
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*Prepared By:*

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**NRC Project # 007-0076-01**

Rachel Veltman
Environmental Scientist/Botanist

William R. Pool
Principal Scientist

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## INTRODUCTION AND OBJECTIVES

Wisconsin Power and Light Company (WP&L) operates the Prairie du Sac (PDS) hydroelectric facility on the Wisconsin River in Prairie du Sac, Columbia and Sauk Counties, Wisconsin. In accordance with Article 404 of the Federal Energy Regulatory Commission (FERC) Order Issuing Original License (June 27, 2002) for the Prairie du Sac Hydroelectric Project, FERC Project No. 11162, WP&L was required to develop and implement a dissolved oxygen monitoring and enhancement plan for this facility. Historic water quality monitoring conducted by WP&L and the Wisconsin Department of Natural Resources (WDNR) indicated that at times dissolved oxygen concentrations may be lower than the 5 mg/L Water Quality Standard as specified under Wisconsin Administrative Code Chapter NR 102. Monitoring has shown that dissolved oxygen concentrations may be as low as 2 to 3 mg/L at the intake and in the tailrace during summer months. WP&L also previously investigated the use of turbine vacuum breakers to raise dissolved oxygen levels in the turbine discharge; however the results were reportedly inconclusive.

On behalf of WP&L, Natural Resources Consulting, Inc. (NRC) developed the dissolved oxygen monitoring and enhancement plan for the PDS facility, which was filed with FERC on March 27, 2003. The *Order Approving Water Quality Monitoring Plan Under Article 404* (Order) was issued by FERC on September 11, 2003. The plan requires WP&L to monitor dissolved oxygen levels at their PDS facility during the summer low flow periods for a three-year period and re-evaluate the potential for vacuum breakers to increase dissolved oxygen levels in the tailrace. In 2004, the vacuum breakers were evaluated and proven to be ineffective at increasing dissolved oxygen concentrations ([DO]) in the tailrace, and therefore were not evaluated this year.

In 2006, NRC conducted the final year of the water quality investigation at the PDS facility according to the Order. In 2007, NRC continued the water quality investigation to provide an additional year of data to support future efforts to increase DO concentrations in the tailrace. This report summarizes the methods and results of the 2007 investigation.

## METHODS

An AquaSonde 2002 dissolved oxygen and temperature data logger was installed just upstream of an operating turbine unit intake and in the tailrace associated with the same unit immediately downstream of the facility from June 27, 2007 to September 17, 2007 to monitor water quality conditions. The upstream logger was deployed midway between the bottom of the intake wall and the lake bottom, which is a depth of approximately 20 feet. The downstream logger was installed at approximately mid-depth in the turbine discharge area of the tailrace. The loggers were programmed to record dissolved oxygen and temperature at 15-minute intervals, and were downloaded and serviced (probe cleaning, recalibration, etc.) twice per week.

The data loggers were installed at Turbine Unit 2 from June 27 through September 17, 2007 (Table 1). Logger #119 on the upstream side was removed for repair on August 23 and replaced by Logger # 171 on September 1. The downstream logger #172 was deployed for the entire monitoring period.

**Table 1. Summary of Data Logger Deployment**

| LOCATION | PERIOD | LOGGER # |
|---|---|---|
| **UNIT 2** | | |
| Upstream | 6/27 to 8/23 | 119 |
| | 9/1 to 9/17 | 171 |
| Downstream | 6/27 to 9/17 | 172 |

The data loggers were calibrated twice per week (Appendix A). These calibration data were used to adjust DO values to account for instrument drift. The calibration data adjustment shift was determined by observing the DO readings in a water-saturated air chamber before and after calibration. This shift was applied to the data set and prorated back to a difference of 0 mg/L at the time of the last calibration. While we understand the instrument likely did not begin drifting immediately after it was replaced in the water after calibration, it is not possible to determine when the instrument actually began to drift between download periods. As such, the corrected and uncorrected values provide a likely range of the number of times DO concentrations were below 5.0 mg/L. All calculations in this report are based on corrected values unless otherwise stated.

Upstream DO readings tended to fluctuate rapidly. The upstream data set was transformed by using a 2-hr rolling average (i.e. each data point is the mean of the four data points in the preceding hour and the three data points in the subsequent forty-five minutes) for the purpose of smoothing the data for legibility and discernment of trends. The untransformed, corrected data was used for calculation of the percentage of time the DO readings were under 5 mg/L.

WP&L staff manually measured DO and water temperature with a Yellow Springs Inc. (YSI) Model 55 hand-held instrument in an upstream and downstream location every work day morning during the logger-deployment period. Upstream of the facility, measurements were taken throughout the water column at one-meter increments in front of the intake at Unit 2. The bottom measurement was normally taken around 11 meters (~36 feet). At downstream locations, measurements were taken at Unit 8 (the lock side), Unit 1 (the shore side) and at an operating unit between these areas (Unit 2, except for 6/28/07 through 7/2/07, when readings were taken at Unit 4). The downstream readings were taken at mid-depth, since minimal stratification had been observed during the 2004 monitoring period. The main intent of these manual measurements was to validate DO concentrations recorded by the data loggers.

## RESULTS

### Continuous Data Loggers

The relationship between temperature and DO upstream and downstream of the PDS facility from June 27 through September 17, 2007 is presented in Figures 1 and 2, respectively. A summary table of these data is presented in Table 2. During this deployment period, the data loggers were installed at Unit 2.

**Table 2. Summary of Water Temperature and Dissolved Oxygen June 27 through September 17, 2007 at the Prairie du Sac Facility.**

| TEMPERATURE (°C) | | | |
|---|---|---|---|
| | Minimum | Maximum | Mean |
| Upstream | 19.2 | 28.6 | 25.0 |
| Downstream | 18.6 | 27.3 | 24.5 |
| DISSOLVED OXYGEN (mg/L) | | | |
| | Minimum | Maximum | Mean |
| Upstream (uncorrected) | 0.1 | 17.4 | 6.6 |
| Upstream (corrected) | 0.08 | 16.8 | 6.6 |
| Downstream (uncorrected) | 0.5 | 15.0 | 6.0 |
| Downstream (corrected) | 0.5 | 15.9 | 6.1 |

The data set from the upstream data logger is incomplete. Logger #119 was removed for repairs on August 23, and a replacement logger (#171) was procured and deployed on September 1, 2007. Thus there is a gap in the upstream data from August 23 to September 1, 2007.

Figures 1 and 2 show the water temperature and DO values for the upstream and downstream monitoring locations. Figure 3 compares the water temperatures for the two locations, and Figure 4 compares the DO concentrations for the two locations. Figure 5 shows the daily maximum and minimum air temperatures and daily precipitation totalss, taken from KWIPRAIR3, a local personal weather station in Prairie du Sac (lat N 43 deg. 16’ 55”, long 89 deg. 44’ 34”, elevation 780 feet, records available on www.wunderground.com).

The temperature data display a regular diurnal cycle, with peaks in the late afternoon and evening hours.

Differences between the peak and low readings ranged from 0.01ºC to more than 2.5 ºC. Upstream temperature peaks are typically 0.5 – 1 ºC greater than downstream temperature peaks, but the low readings tend to correspond between upstream and downstream.

Dissolved oxygen concentrations tended to show peaks that correlated with the water temperature peaks, but also displayed additional peaks that indicate that other factors beside water temperature are influencing DO concentrations.

Disruption of the regular diurnal temperature cycle (and in part, the DO concentrations) tended to correspond with precipitation events (Figure 5). A large storm event which affected a large area of the upstream reach of the Wisconsin River on August 17 and the days thereafter marked the start of a week-long temperature drop from over 26 ºC to slightly over 21ºC. This appears to have contributed to a rise in downstream DO concentrations (upstream data set is missing for this period).

On September 10-11, night-time low air temperatures began dropping below 10 ºC. This, in combination with another precipitation event on September 10, corresponds with a steady drop in water temperatures and a rise in DO upstream.

Dissolved oxygen levels upstream and downstream of Unit 2 generally followed similar trends during this monitoring period. Upstream DO levels were typically higher than downstream levels, with the exception of the following periods, when they were lower: 7/2 – 7/7, 8/18 – 8/23, and 9/10 – 9/13.

Dissolved oxygen concentrations downstream of Unit 2 dropped below 5.0 mg/L between 28.0 percent (corrected values) and 32.6 percent (uncorrected values) of the time during this monitoring period. There were twenty-five periods of non-compliance during the monitoring period, with the first period starting 06/27/07 and the last period starting 09/13/07 (Table 3). The period durations ranged from fifteen minutes to seven days. The longest periods occurred in late July and all of August. The mean temperatures for each period averaged 24.89 degrees Celsius, while the mean DO concentrations for each period averaged 4.37 mg/L.

**Table 3. Characteristics of Periods of Non-Compliance in Downstream Waters, Prairie du Sac Facility,**

**2007.**

| Period Start Date and Time | Duration (hours) | Mean DO (mg/L) | Mean Temperature (deg. C) |
|---|---|---|---|
| 6/27/2007 14:58 | 11.75 | 4.47 | 24.57 |
| 7/5/2007 10:43 | 9.75 | 4.20 | 24.88 |
| 7/7/2007 14:43 | 38.5 | 2.69 | 24.67 |
| 7/10/2007 16:43 | 2.75 | 4.78 | 26.09 |
| 7/11/2007 3:43 | 1.5 | 4.87 | 25.95 |
| 7/11/2007 17:58 | 1.5 | 4.93 | 25.96 |
| 7/12/2007 18:28 | 1.25 | 4.93 | 25.76 |
| 7/14/2007 2:28 | 10.25 | 4.70 | 25.42 |
| 7/15/2007 7:13 | 2 | 4.98 | 25.08 |
| 7/16/2007 0:58 | 176 | 3.38 | 24.50 |
| 7/31/2007 5:13 | 82 | 2.57 | 25.80 |
| 8/4/2007 6:43 | 7.25 | 4.78 | 26.33 |
| 8/5/2007 13:43 | 73.5 | 3.70 | 25.72 |
| 8/9/2007 21:28 | 49.5 | 3.47 | 25.85 |
| 8/14/2007 5:43 | 11 | 4.48 | 26.26 |
| 8/15/2007 8:28 | 23.75 | 4.64 | 26.12 |
| 8/17/2007 2:15 | 5.5 | 4.76 | 25.95 |
| 8/20/2007 10:30 | 0.25 | 4.98 | 23.68 |
| 9/2/2007 13:45 | 6.25 | 4.26 | 22.59 |
| 9/5/2007 18:00 | 1.75 | 4.76 | 23.23 |
| 9/6/2007 1:15 | 8 | 4.67 | 23.34 |
| 9/7/2007 10:00 | 2 | 4.67 | 23.63 |
| 9/9/2007 21:45 | 10.75 | 4.65 | 24.29 |
| 9/13/2007 13:00 | 9.75 | 4.53 | 21.74 |
| Mean | 22.77 | 4.37 | 24.89 |
| Maximum | 176 | 4.98 | 26.33 |
| Minimum | 0.25 | 2.57 | 21.74 |

## Manual Monitoring

Field sheets summarizing manual dissolved oxygen and water temperature measurements upstream and downstream of the facility are provided in Appendix B and C, respectively. The main intent of this manual monitoring was to validate dissolved oxygen measurements recorded by the data loggers.

A comparison of the corrected values for the continuous dissolved oxygen measurements with the manual readings are presented in Figures 6 and 7. The values for the continuous logger were taken at the same time as the manual reading. The manual measurements prior to 7/12 may not be accurate. During an instrument check on 7/12 (the first check performed by NRC), NRC noted that the instrument was assembled incorrectly and had bubbles under the membrane. Therefore, the readings prior to 7/12 are suspect and were not used. (After 7/12, the manual instrument was checked each time the continuous loggers were calibrated.) Apart from the pre-7/12 readings, the continuous and corrected dissolved oxygen measurements compared favorably with the manual measurements. The downstream corrected continuous logger measurements were within 15 percent of the manual readings over 83 percent of the time.

Although the differences between the manual and continuous values were noteworthy at times, the overall trends were similar. The manual readings were below 5.0 mg/L 48 percent of the time downstream, and 36 percent of the time upstream. The corrected logger measurements were below 5.0 mg/L 42.8 percent of the time downstream, and 44 percent upstream. All of the data was taken from the closest corresponding point in time. The dissolved oxygen readings were generally lower likely because the readings were taken in the morning, when the values are expected to be lower.

The upstream manual readings were taken at one meter intervals and showed the stratification of the upstream pool when present. The amount of stratification varied widely and from day to day. The chemocline (dramatic shift in DO concentrations) varied from six meter depths to ten meter depths.

## CONCLUSIONS

Dissolved oxygen and water temperature was continuously monitored upstream and downstream of an operating turbine unit (Unit 2) at the PDS facility from June 27 through September 17, 2007. Dissolved oxygen concentrations downstream of this unit dropped below 5.0 mg/L between 28 percent (corrected values) and 32.6 percent (uncorrected values) of the time during this monitoring period.

Manual measurements of dissolved oxygen were also taken upstream and downstream of the operating turbine unit, primarily to validate data logger measurements. Differences in the data were observed between the data logger and manual measurements. The differences in the data are likely due to different measurement locations and times, as well as some equipment failures during the observation period. Although some differences were observed, the data generally trended together. However both manual and logger dissolved oxygen values were low. For the downstream monitoring location, the manual dissolved oxygen readings were below 5.0 mg/L 47.6 percent of the time and the downstream corrected logger measurements were below 5.0 mg/L 42.8 percent of the time. For the upstream monitoring location, the manual dissolved oxygen readings were below 5.0 mg/L 35.7 percent of the time and the downstream corrected logger measurements were below 5.0 mg/L 44 percent of the time.

## STUDY SUMMARY

On behalf of WP&L, NRC monitored dissolved oxygen levels at their PDS facility during the summer low flow periods from 2004 to 2007. Turbine vacuum breakers were evaluated as a means of introducing dissolved oxygen in tailrace areas in 2004. Vacuum breaker evaluations were conducted at Unit 5 on two occasions and at Unit 8 on nine occasions. Results of these evaluations indicated that the vacuum breakers were ineffective at increasing dissolved oxygen levels in the tailrace, and therefore were not evaluated in subsequent years.

The most significant conclusion of the four-year monitoring is that DO concentrations in the tailrace drop below the 5.0 mg/L Water Quality Standard as specified under Wisconsin Administrative Code Chapter NR 102. Table 4 summarizes the non-compliance periods for the four-year monitoring period.

**Table 4. Dissolved oxygen concentrations were under 5.0 mg/L during the summer periods from 2004 to 2007 downstream of running turbines at the Prairie du Sac Facility.**

| Year | Percent time under 5.0 mg/L (using corrected values) |
|---|---|
| 2004 | 16.6 |
| 2005 | 40.9 |
| 2006 | 32.5 |
| 2007 | 28.0 |

General observations of annual weather patterns, such as differences in seasonal air temperature and precipitation suggest the extent and duration of readings below the 5.0 mgl/L threshold correlate to summer weather conditions.

**Figure 1. Water Temperature and Dissolved Oxygen Values Upstream of Prairie du Sac Facility**

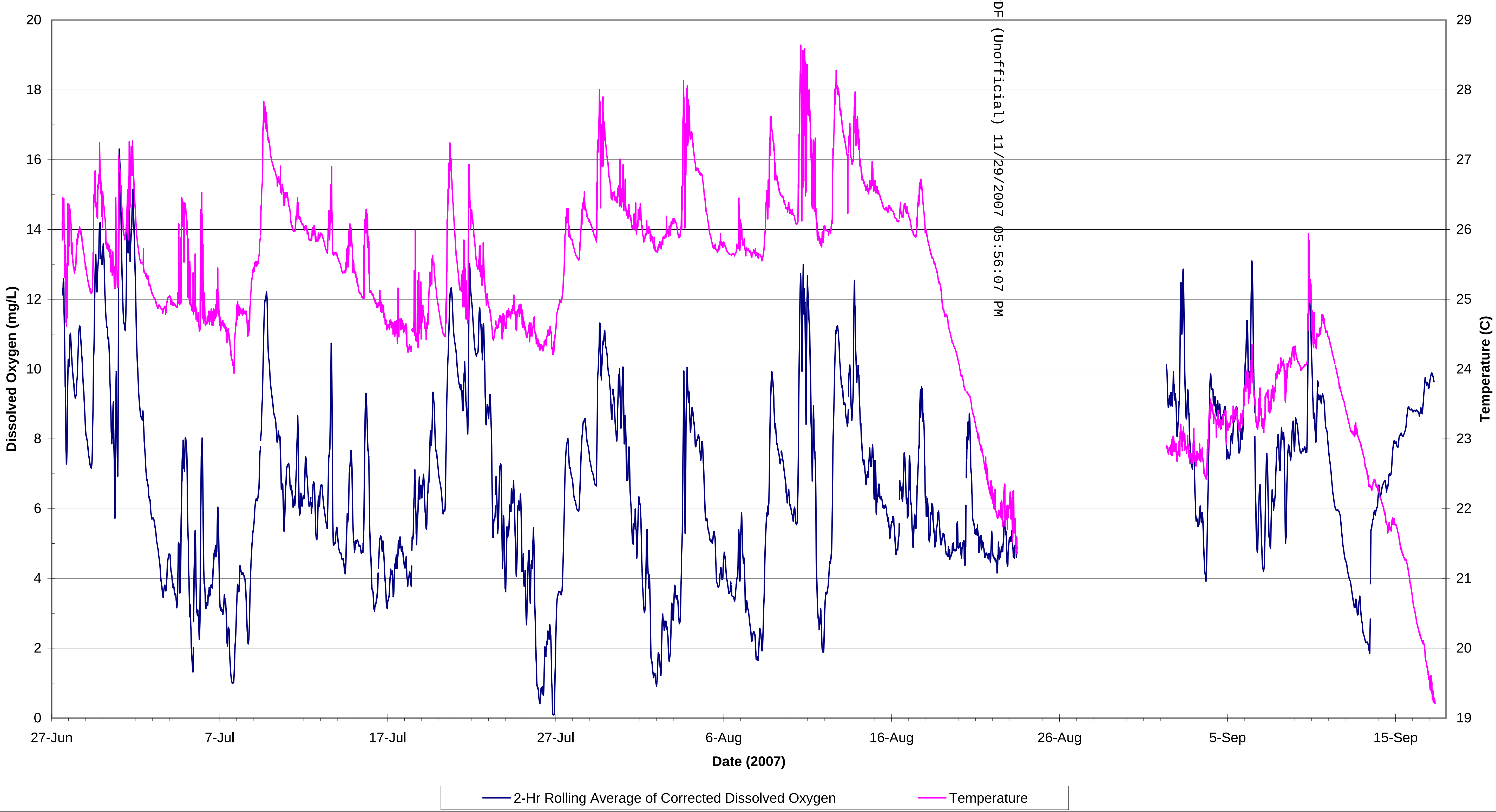


Figure 2. Water Temperature and Dissolved Oxygen Values Downstream of the Prairie du Sac Facility

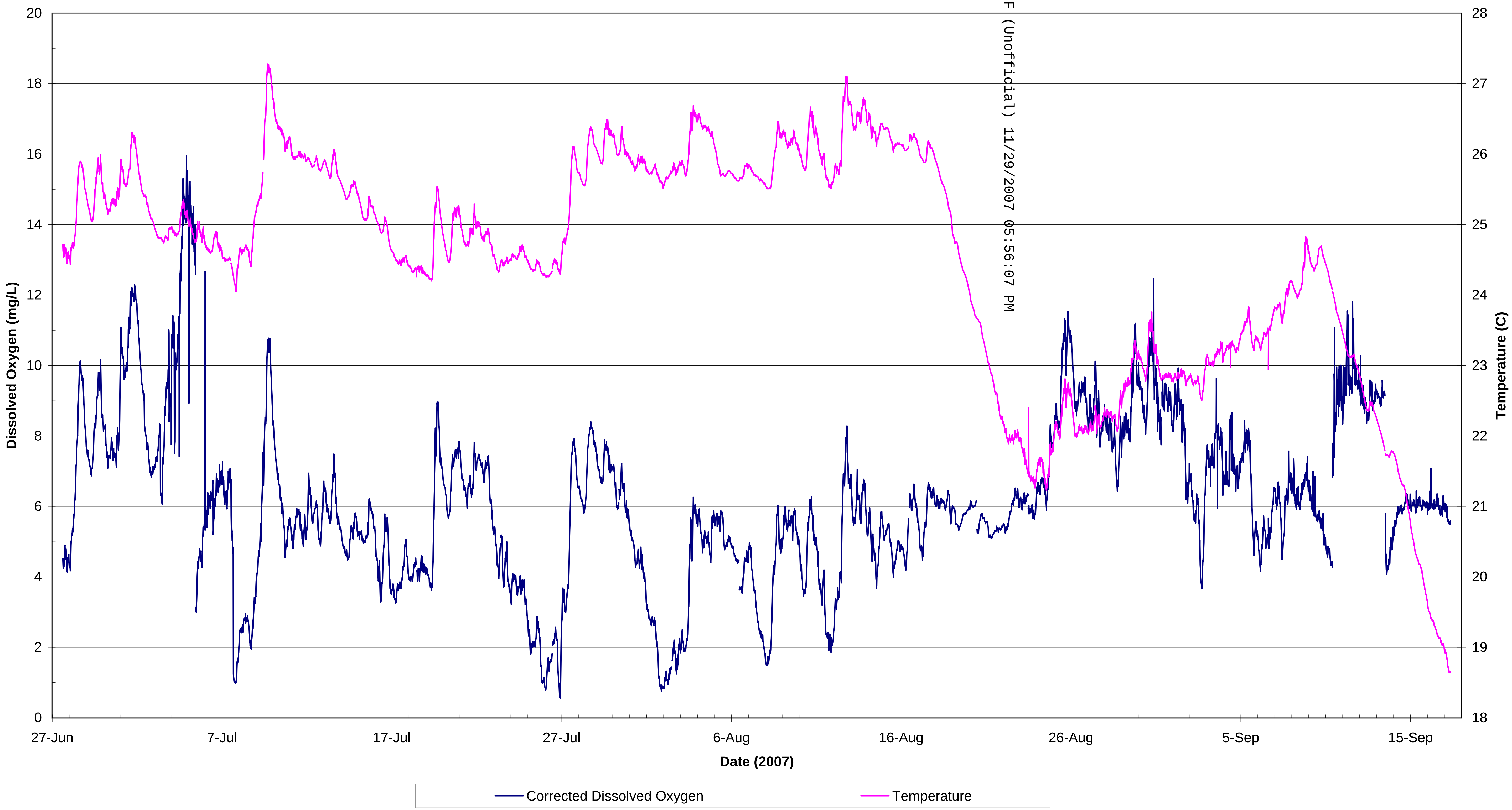
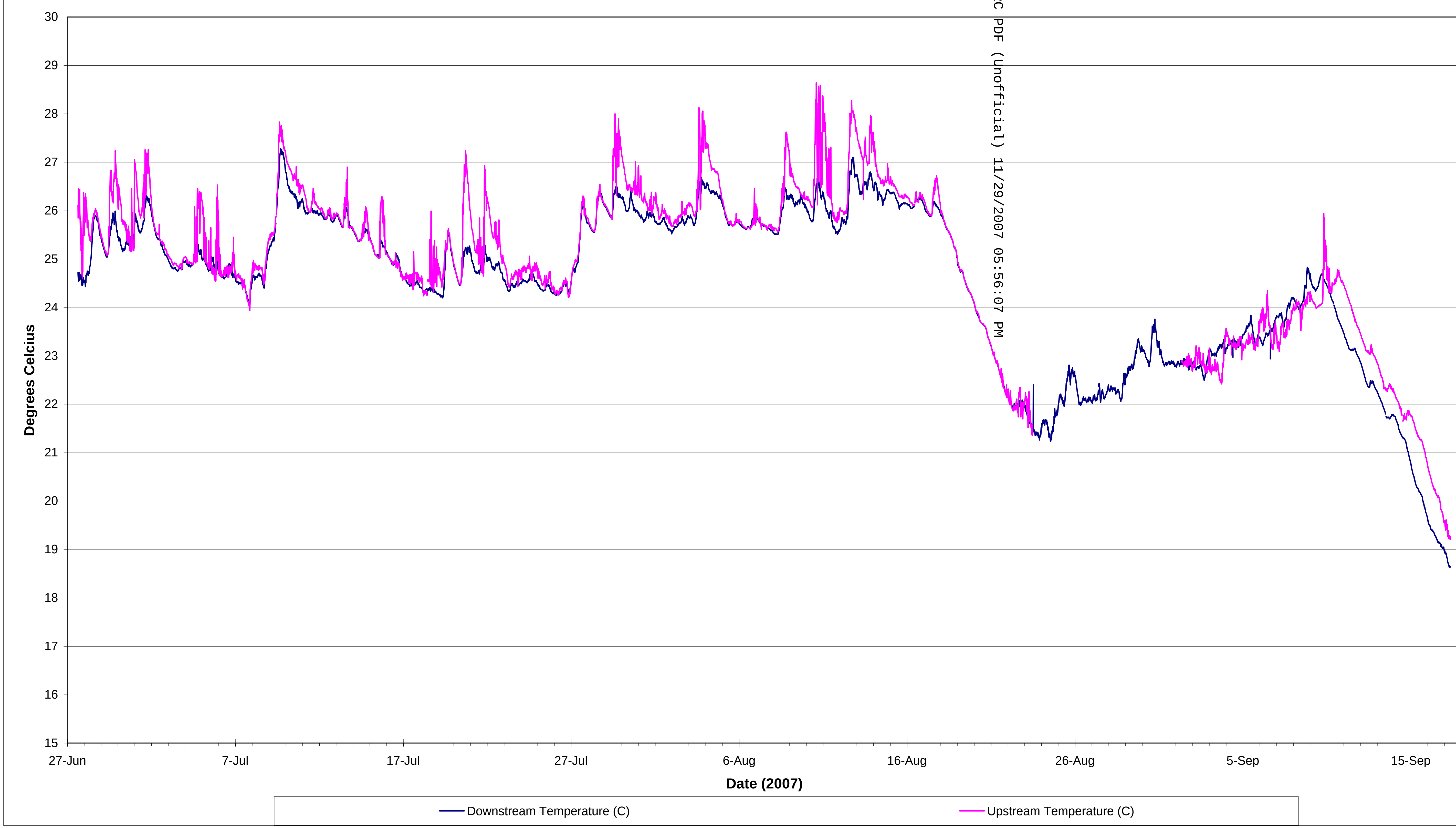


**Figure 3. Comparisons of Upstream and Downstream Water Temperatures at the Prairie du Sac Facility**



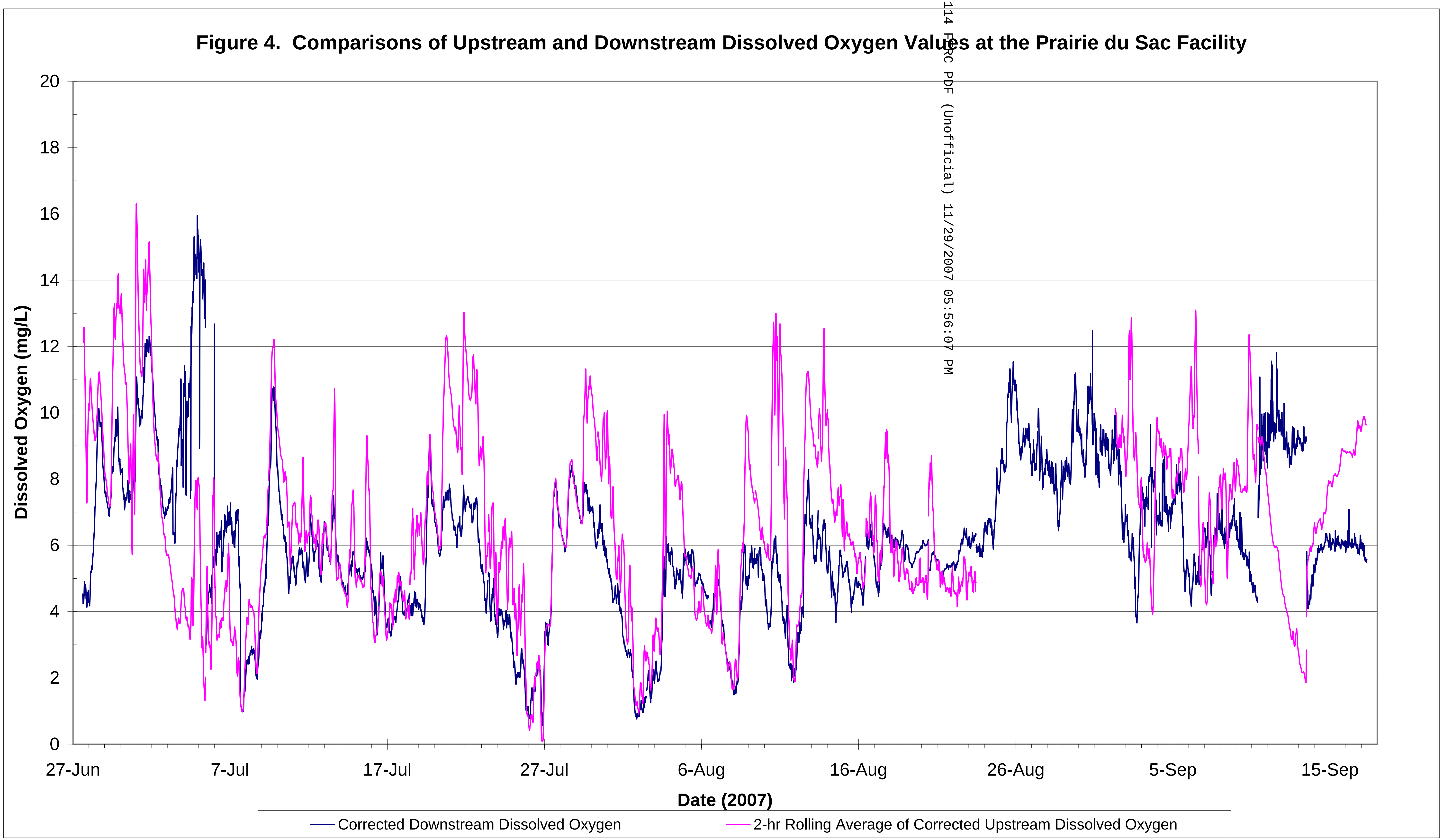


Figure 4. Comparisons of Upstream and Downstream Dissolved Oxygen Values at the Prairie du Sac Facility
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
14
16
18
20
27-Jun
7-Jul
17-Jul
27-Jul
6-Aug
16-Aug
26-Aug
5-Sep
15-Sep
Date (2007)
Corrected Downstream Dissolved Oxygen
2-hr Rolling Average of Corrected Upstream Dissolved Oxygen

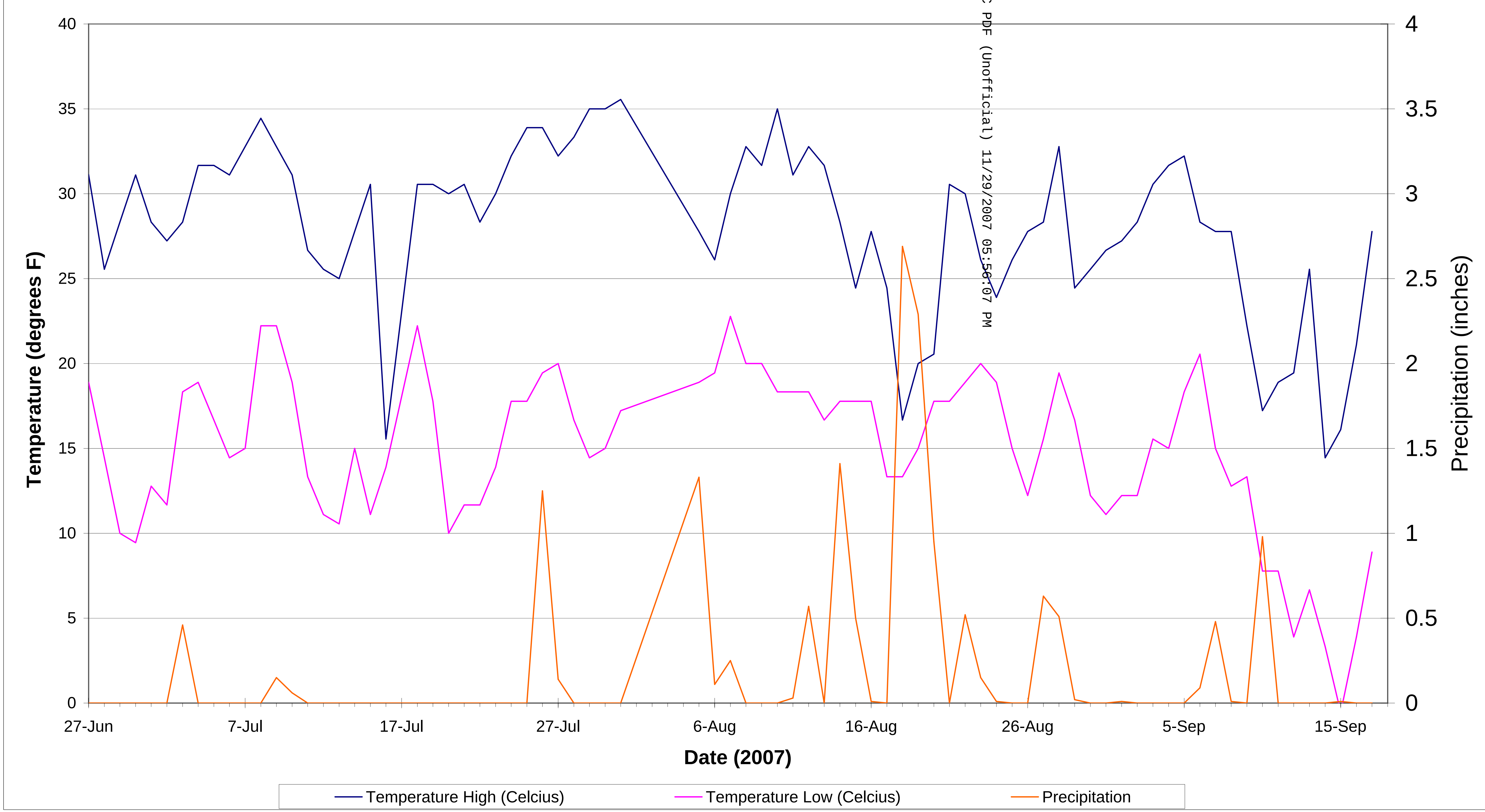



**Figure 5. Daily High and Low Air Temperatures and Daily Precipitation, Prairie du Sac, Wisconsin**

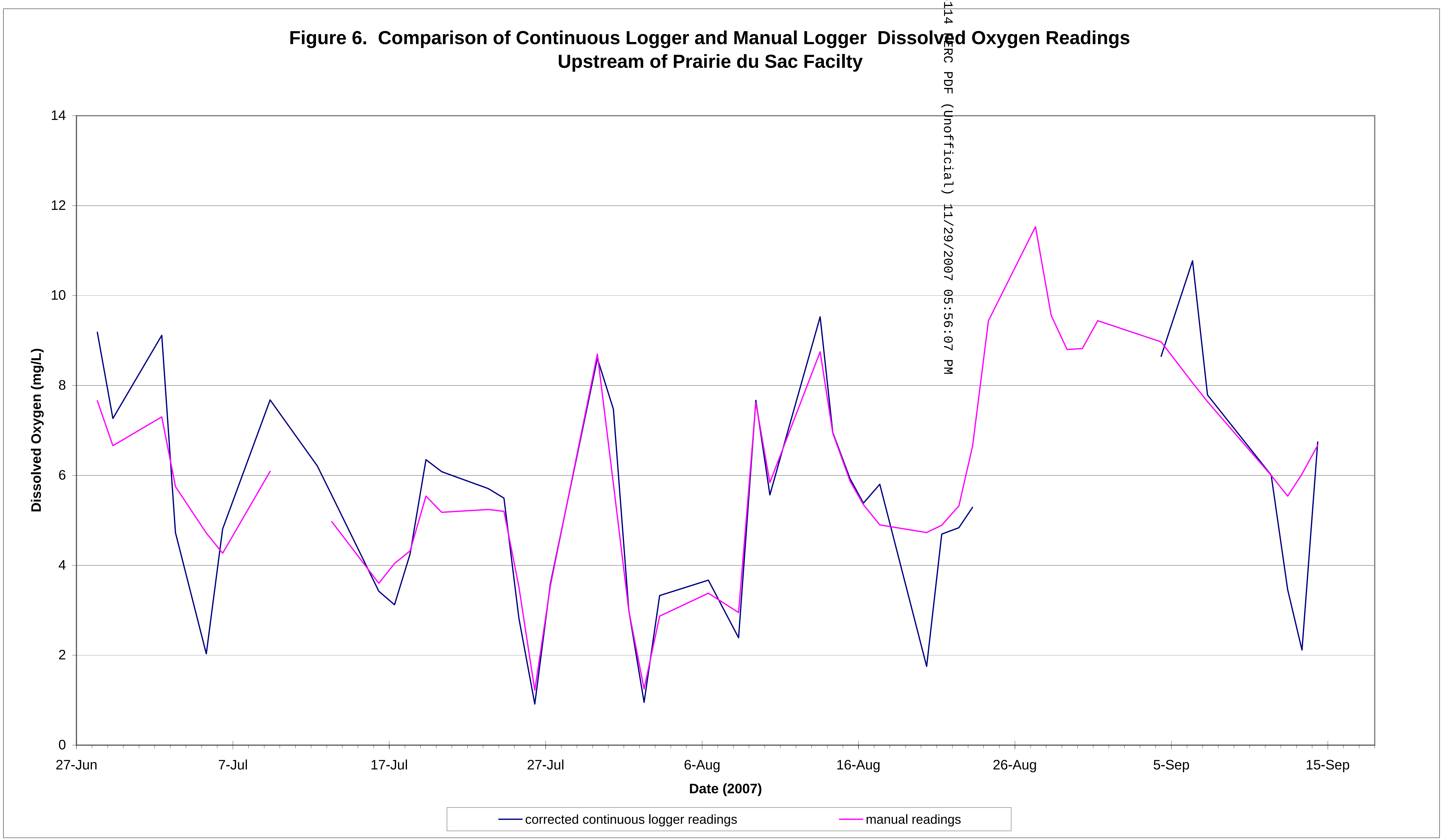


Figure 6. Comparison of Continuous Logger and Manual Logger Dissolved Oxygen Readings
Upstream of Prairie du Sac Facilty
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
14
27-Jun
7-Jul
17-Jul
27-Jul
6-Aug
16-Aug
26-Aug
5-Sep
15-Sep
Date (2007)
corrected continuous logger readings
manual readings

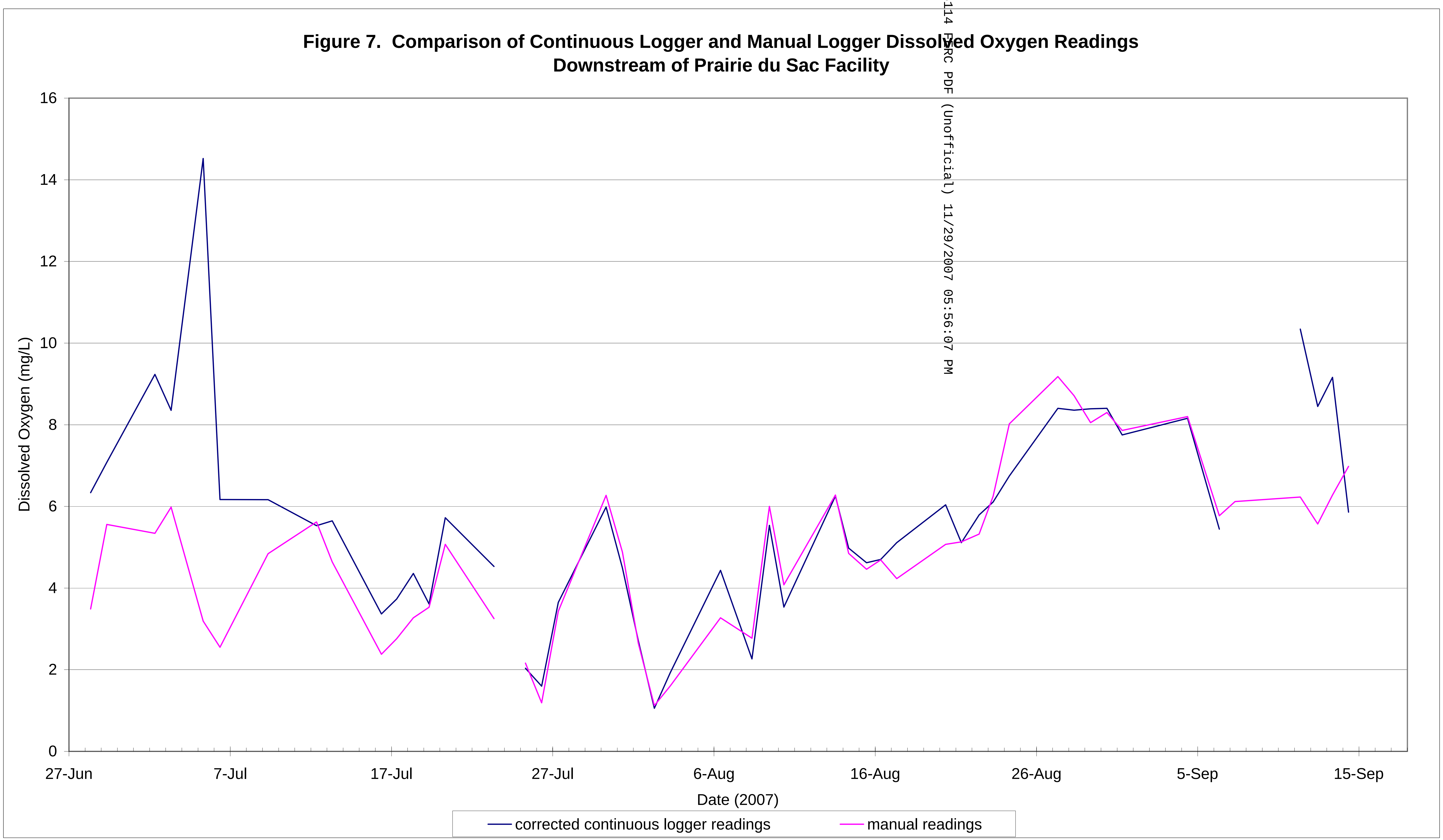


Figure 7. Comparison of Continuous Logger and Manual Logger Dissolved Oxygen Readings
Downstream of Prairie du Sac Facility
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
14
16
27-Jun
7-Jul
17-Jul
27-Jul
6-Aug
16-Aug
26-Aug
5-Sep
15-Sep
Date (2007)
corrected continuous logger readings
manual readings

# APPENDIX A

# DATA LOGGER CALIBRATION LOG

**Prairie du Sac Hydroelectric Project**
**2007 Calibration Log - Upstream**

| Date/Time | Logger No. | Temperature Before (°C) | Temperature After (°C) | Temperature Difference (°C) | Dissolved Oxygen Before (mg/L) | Dissolved Oxygen After (mg/L) | Dissolved Oxygen Difference (mg/L) |
|---|---|---|---|---|---|---|---|
| 6/27/07 14:11 | 119 | 27.44 | 24.84 | -2.6 | 7.4 | 8.05 | 0.65 |
| 7/2/07 9:22 | 119 | 22.73 | 21.02 | -1.71 | 8.94 | 8.66 | -0.28 |
| 7/5/07 10:20 | 119 | 24.64 | 23.63 | -1.01 | 7.1 | 8.23 | 1.13 |
| 7/9/07 10:21 | 119 | 24.56 | 22.97 | -1.59 | 8.04 | 8.34 | 0.3 |
| 7/12/07 10:20 | 119 | 23.26 | 22.42 | -0.84 | 8.26 | 8.41 | 0.15 |
| 7/16/07 10:14 | 119 | 22.38 | 21.56 | -0.82 | 8.24 | 8.58 | 0.34 |
| 7/18/07 10:22 | 119 | 22.1 | 22.1 | 0 | 8.16 | 8.48 | 0.32 |
| 7/23/07 10:02 | 119 | 22.76 | 22.55 | -0.21 | 8.3 | 8.41 | 0.11 |
| 7/26/07 10:40 | 119 | 22.12 | 22.07 | -0.05 | 8.44 | 8.48 | 0.04 |
| 7/30/07 9:03 | 119 | 20.76 | 21.41 | 0.65 | 8.97 | 8.62 | -0.35 |
| 8/2/07 11:34 | 119 | 24.52 | 24.16 | -0.36 | 7.89 | 8.15 | 0.26 |
| 8/6/07 10:35 | 119 | 23.56 | 22.31 | -1.25 | 7.78 | 8.58 | 0.8 |
| 8/9/07 9:52 | 119 | 24.85 | 23.64 | -1.21 | 8.05 | 8.21 | 0.16 |
| 8/13/07 10:13 | 119 | 24.75 | 24.12 | -0.63 | 7.64 | 8.14 | 0.5 |
| 8/16/07 10:57 | 119 | 21.96 | 21.56 | -0.4 | 8.52 | 8.55 | 0.03 |
| 8/20/07 10:29 | 119 | 22.49 | 20.87 | -1.62 | 7.12 | 8.35 | 1.23 |
| 8/23/07 11:30 | 119 | 21.64 | 21.52 | -0.12 | 7.9 | 8.34 | 0.44 |
| 8/27/07 9:32 | 119 | 20.75 | 20.09 | -0.66 | 8.33 | 8.76 | 0.43 |
| 8/31/07 8:36 | 171 | 22.79 | 22.24 | -0.55 | 9.27 | 8.46 | -0.81 |
| 9/4/07 9:59 | 171 | 20.25 | 20.83 | 0.58 | 8.48 | 8.7 | 0.22 |
| 9/6/07 14:47 | 171 | 22.87 | 22.75 | -0.12 | 8.15 | 8.37 | 0.22 |
| 9/10/07 9:48 | 171 | 20.68 | 20.63 | -0.05 | 8.53 | 8.74 | 0.21 |
| 9/13/07 11:50 | 171 | 20.55 | 20.51 | -0.04 | 8.75 | 8.73 | -0.02 |
| 9/17/07 9:02 | 171 | 17.19 | 17.18 | -0.01 | 9.4 | 9.35 | -0.05 |

**Prairie du Sac Hydroelectric Project**
**2007 Calibration Log - Downstream**

| Date/Time | Logger No. | Temperature Before (°C) | Temperature After (°C) | Temperature Difference (°C) | Dissolved Oxygen Before (mg/L) | Dissolved Oxygen After (mg/L) | Dissolved Oxygen Difference (mg/L) |
|---|---|---|---|---|---|---|---|
| 6/27/07 14:47 | 172 | 22.7 | 22.58 | -0.12 | 8.37 | 8.4 | 0.03 |
| 7/2/07 9:57 | 172 | 23.35 | 22.81 | -0.54 | 9.27 | 8.37 | -0.9 |
| 7/5/07 10:44 | 172 | 25.93 | 25.09 | -0.84 | 10.56 | 8.03 | -2.53 |
| 7/9/07 10:50 | 172 | 24.26 | 20.68 | -3.58 | 7.17 | 8.66 | 1.49 |
| 7/12/07 10:41 | 172 | 23.44 | 23.54 | 0.1 | 8.14 | 8.25 | 0.11 |
| 7/16/07 10:25 | 172 | 23.4 | 23.04 | -0.36 | 8.06 | 8.33 | 0.27 |
| 7/18/07 10:36 | 172 | 23.28 | 23.21 | -0.07 | 8.13 | 8.31 | 0.18 |
| 7/23/07 10:16 | 172 | 23.4 | 23.32 | -0.08 | 8.07 | 8.28 | 0.21 |
| 7/26/07 10:53 | 172 | 23.78 | 23.73 | -0.05 | 7.9 | 8.21 | 0.31 |
| 7/30/07 9:20 | 172 | 24.48 | 23.98 | -0.5 | 8.42 | 8.19 | -0.23 |
| 8/2/07 11:55 | 172 | 25.33 | 25.27 | -0.06 | 7.18 | 7.99 | 0.81 |
| 8/6/07 10:52 | 172 | 24.15 | 23.25 | -0.9 | 8.27 | 8.4 | 0.13 |
| 8/9/07 10:06 | 172 | 24.32 | 23.89 | -0.43 | 8.46 | 8.19 | -0.27 |
| 8/13/07 10:29 | 172 | 24.52 | 24.22 | -0.3 | 8.3 | 8.16 | -0.14 |
| 8/16/07 11:13 | 172 | 23.42 | 23.38 | -0.04 | 8.35 | 8.27 | -0.08 |
| 8/20/07 10:59 | 172 | 22.11 | 21.79 | -0.32 | 8.11 | 8.52 | 0.41 |
| 8/23/07 12:13 | 172 | 22.56 | 22.55 | -0.01 | 8.6 | 8.44 | -0.16 |
| 8/27/07 9:46 | 172 | 21.02 | 20.42 | -0.6 | 8.75 | 8.8 | 0.05 |
| 8/31/07 8:52 | 172 | 22 | 21.48 | -0.52 | 8.08 | 8.6 | 0.52 |
| 9/4/07 10:06 | 172 | 22.96 | 22.79 | -0.17 | 8.6 | 8.8 | 0.2 |
| 9/6/07 15:03 | 172 | 23.11 | 23.08 | -0.03 | 7.34 | 8.26 | 0.92 |
| 9/10/07 10:04 | 172 | 21.06 | 20.85 | -0.21 | 1.75 | 9.76 | 8.01 |
| 9/13/07 12:04 | 172 | 21.36 | 21.31 | -0.05 | 12.19 | 8.62 | -3.57 |
| 9/17/07 8:48 | 172 | 17.38 | 17.21 | -0.17 | 6.28 | 9.38 | 3.1 |

# APPENDIX B

## FIELD SHEETS OF UPSTREAM MANUAL MEASUREMENTS

*Prairie du Sac Hydroelectric Project*
*2007 DO/Temp. Upstream Daily Profile Log*

Date: 6-28-07 Time: 8:00

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature 63 |
|---|---|---|---|
| Surface | ↓ | 7.62 | 25.3 |
| 1 | | 7.06 | 25.3 |
| 2 | | 7.15 | 25.3 |
| 3 | | 7.17 | 25.3 |
| 4 | | 7.65 | 25.4 |
| 5 | | 7.90 | 25.4 |
| 6 | | 7.66 | 25.4 |
| 7 | | 7.42 | 25.4 |
| 8 | | 7.38 | 25.4 |
| 9 | | 7.36 | 25.4 |
| 10 | | 7.36 | 25.4 |
| 11 | | 7.15 | 25.4 |
| 12 | | 6.71 | 25.3 |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 6-29-07 Time: 8:00

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature 62° |
|---|---|---|---|
| Surface | ↓ | 6.06 | 25°c |
| 1 | | 5.81 | 25°c |
| 2 | | 5.77 | 25°c |
| 3 | | 5.84 | 25°c |
| 4 | | 6.14 | 25°c |
| 5 | | 6.62 | 25°c |
| 6 | | 6.66 | 25°c |
| 7 | | 6.49 | 25°c |
| 8 | | 6.51 | 25°c |
| 9 | | 6.44 | 25.1°c |
| 10 | | 6.42 | 25.0°c |
| 11 | ↓ | 6.32 | 25°c |
| 12 | | 6.42 | 25°C |
| 13 | | | |
| 14 | | | |
| 15 | | | |

# *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-2-07 Time: 10:55

| **Depth (meters)** | **Turbine Unit #** 2 | **Dissolved Oxygen** | **Temperature** |
|---|---|---|---|
| Surface | | 7.73 | 26.0 |
| 1 | | 7.40 | 26.1 |
| 2 | | 7.00 | 25.7 |
| 3 | | 7.40 | 25.6 |
| 4 | | 7.60 | 25.4 |
| 5 | | 7.67 | 25.4 |
| 6 | | 7.30 | 25.4 |
| 7 | | 7.40 | 25.4 |
| 8 | | 7.50 | 25.3 |
| 9 | | 7.51 | 253 |
| 10 | | 7.46 | 25.3 |
| 11 | | 7.15 | 253 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 7-3-07 Time: 0800

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 4.85 | 24.6 |
| 1 | | 4.29 | 24.7 |
| 2 | | 4.49 | 24.8 |
| 3 | | 4.53 | 24.8 |
| 4 | | 4.72 | 24.9 |
| 5 | | 5.97 | 24.9 |
| 6 | | 5.75 | 24.8 |
| 7 | | 5.53 | 24.8 |
| 8 | | 5.46 | 24.8 |
| 9 | | 5.10 | 24.8 |
| 10 | | 4.86 | 24.8 |
| 11 | ↓ | 4.76 | 24.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

66° Cloudy

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-5-07 Time: 0710

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 6.70 | 25.2 |
| 1 | | 6.70 | 25.3 |
| 2 | | 6.67 | 25.4 |
| 3 | | 6.90 | 25.4 |
| 4 | | 7.71 | 25.4 |
| 5 | | 7.74 | 25.4 |
| 6 | | 4.72 | 24.9 |
| 7 | | 4.19 | 24.8 |
| 8 | | 3.98 | 24.8 |
| 9 | | 3.89 | 24.8 |
| 10 | | 3.81 | 24.8 |
| 11 | | 3.77 | 24.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

.39 Precip. 7/3-7/4
Clear 67° Now Expected
60° Low 87° Today

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Date: 7-6-07 Time: 0820

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.70 | 25.0 |
| 1 | | 5.50 | 25.1 |
| 2 | | 5.91 | 25.1 |
| 3 | | 6.03 | 25.1 |
| 4 | | 4.92 | 25.0 |
| 5 | | 5.72 | 24.8 |
| 6 | | 4.27 | 24.8 |
| 7 | | 3.05 | 24.5 |
| 8 | | 1.32 | 24.2 |
| 9 | | .92 | 24.1 |
| 10 | | .40 | 24.1 |
| 11 | | .28 | 24.1 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

Yesterday 89° Clear
Expected Today 88° 2770 cfs

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 7/9/07 Time: 0920

| Depth (meters) | Turbine Unit # | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface Lt Rain 82° | Unit 2 | 4.97 | 25.8 |
| 1 | " | 4.74 | 25.8 |
| 2 | | 4.78 | " |
| 3 | | 4.89 | " |
| 4 | | 5.17 | " |
| 5 | | 5.64 | " |
| 6 | | 6.09 | " |
| 7 | | 5.98 | " |
| 8 | | 5.90 | " |
| 9 | | 5.71 | " |
| 10 | | 6.55 | " |
| 11 | | 6.37 | " |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Sunny NE wind

Date: 7/12/07 Time: 0930

| Depth (meters) | Turbine Unit # | Dissolved Oxygen | Temperature |
|---|---|---|---|
| | running #2 | | |
| Surface | | 60.1 | 25.6 |
| 1 | | 61.3 | 25.9 |
| 2 | | 63.5 | 25.9 |
| 3 | | 65.3 | 25.9 |
| 4 | | 64.7 | 25.9 |
| 5 | | 59.5 | 25.8 |
| 6 | | 61.7 | 25.8 |
| 7 | | 60.8 | 25.7 |
| 8 | | 56.8 | 25.8 |
| 9 | | 55.1 | 25.8 |
| 10 | | 56.9 | 25.8 |
| 11 | | 46.7 | 25.7 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

sunny 62° North east wind

Date: 7/13/07 Time: 7:45

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.07 | 25.5 |
| 1 | | 4.70 | 25.6 |
| 2 | | 4.83 | 25.6 |
| 3 | | 5.03 | 25.6 |
| 4 | | 5.00 | 25.7 |
| 5 | | 4.96 | 25.6 |
| 6 | | 4.97 | 25.6 |
| 7 | | 4.97 | 25.6 |
| 8 | | 4.89 | 25.6 |
| 9 | | 4.71 | 25.6 |
| 10 | | 4.12 | 25.6 |
| 11 | | 4.53 | 25.6 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

cloudy - 64°

# *Prairie du Sac Hydroelectric Project*
# *2007 DO/Temp. Upstream Daily Profile Log*

Date: 7/16/07 Time: 0800

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 3.91 | 24.7 |
| 1 | | 3.77 | 24.8 |
| 2 | | 3.90 | 24.9 |
| 3 | | 3.92 | 24.9 |
| 4 | | 3.84 | 24.9 |
| 5 | | 3.63 | 24.9 |
| 6 | | 3.60 | 24.9 |
| 7 | | 2.19 | 24.8 |
| 8 | | 2.13 | 24.8 |
| 9 | | 2.05 | 24.8 |
| 10 | | 2.60 | 24.8 |
| 11 | | 2.64 | 24.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

*Prairie du Sac Hydroelectric Project*
*2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-17-07 Time: 0800

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 4.03 | 24.1 |
| 1 | | 3.85 | 24.5 |
| 2 | | 4.02 | 24.5 |
| 3 | | 4.12 | 24.6 |
| 4 | | 4.26 | 24.6 |
| 5 | | 4.27 | 24.6 |
| 6 | | 4.04 | 24.5 |
| 7 | | 1.87 | 24.4 |
| 8 | | 1.92 | 24.2 |
| 9 | | 2.02 | 24.2 |
| 10 | | 1.95 | 24.2 |
| 11 | | 2.13 | 24.2 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

*Prairie du Sac Hydroelectric Project*
*2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-18-07 Time: 8:00

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 5.26 | 24.7 |
| 1 | | 4.97 | 24.7 |
| 2 | | 5.34 | 24.7 |
| 3 | | 5.45 | 24.7 |
| 4 | | 5.00 | 24.5 |
| 5 | | 4.65 | 24.4 |
| 6 | | 4.32 | 24.3 |
| 7 | | 3.94 | 24.3 |
| 8 | | 3.22 | 24.2 |
| 9 | | 2.10 | 24.0 |
| 10 | | 2.12 | 24.0 |
| 11 | | 2.10 | 24.0 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Lt. North Wind

Date: 7-19-07 Time: 0815

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.98 | 24.5 |
| 1 | | 5.72 | 24.7 |
| 2 | | 6.06 | 24.7 |
| 3 | | 6.20 | 24.7 |
| 4 | | 6.48 | 24.6 |
| 5 | | 5.26 | 24.5 |
| 6 | | 5.54 | 24.5 |
| 7 | | 5.01 | 24.5 |
| 8 | | 4.00 | 24.2 |
| 9 | | 1.26 | 23.8 |
| 10 | | 1.28 | 23.8 |
| 11 | | 1.19 | 23.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

**Prairie du Sac Hydroelectric Project**
**2007 DO/Temp. Upstream Daily Profile Log**

#2 running 62° clear 2810 cfs
- #6 & 7

Date: 7/20/07 Time: 0830

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.44 | 24.3 |
| 1 | | 4.80 | 24.4 |
| 2 | | 5.01 | 24.4 |
| 3 | | 5.10 | 24.4 |
| 4 | | 5.34 | 24.4 |
| 5 | | 5.40 | 24.4 |
| 6 | | 5.18 | 24.4 |
| 7 | | 4.71 | 24.4 |
| 8 | | 4.57 | 24.4 |
| 9 | | 4.52 | 24.4 |
| 10 | | 4.50 | 24.4 |
| 11 | | 4.51 | 24.4 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-23-07 Time: 8:00

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 6.15 | 24.5 |
| 1 | | 6.10 | 24.5 |
| 2 | | 6.34 | 24.5 |
| 3 | | 6.77 | 24.4 |
| 4 | | 6.43 | 24.5 |
| 5 | | 5.15 | 24.4 |
| 6 | | 5.24 | 24.4 |
| 7 | | 3.18 | 24.3 |
| 8 | | 3.20 | 24.2 |
| 9 | | 3.26 | 24.3 |
| 10 | | 2.32 | 24.2 |
| 11 | ↓ | 2.22 | 24.4 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Date: 7-24-07 Time: 0805

| Depth (meters) | Turbine Unit # #2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 6.38 | 24.6 |
| 1 | | 6.41 | 24.7 |
| 2 | | 6.24 | 24.8 |
| 3 | | 6.42 | 24.8 |
| 4 | | 6.60 | 24.8 |
| 5 | | 6.64 | 24.7 |
| 6 | | 5.20 | 24.7 |
| 7 | | 4.21 | 24.7 |
| 8 | | 1.69 | 24.3 |
| 9 | | 1.49 | 24.3 |
| 10 | | 1.48 | 24.3 |
| 11 | | 1.48 | 24.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

Yesterday High 89
Expected today 85

PT. Cloudy
2610 CFS

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 7-25-07 Time: 0700

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 3.98 | 24.0 |
| 1 | | 3.87 | 24.4 |
| 2 | | 4.16 | 24.5 |
| 3 | | 4.20 | 24.5 |
| 4 | | 3.96 | 24.5 |
| 5 | | 3.45 | 24.4 |
| 6 | | 3.52 | 24.4 |
| 7 | | 0.75 | 24.3 |
| 8 | | 0.18 | 24.2 |
| 9 | | 0.09 | 23.9 |
| 10 | | 0.09 | 23.9 |
| 11 | ↓ | 0.09 | 23.9 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-26-07 Time: 7:15

| **Depth (meters)** | **Turbine Unit #** | **Dissolved Oxygen** | **Temperature** |
|---|---|---|---|
| Surface | 2 | 2.44 | 24.2 |
| 1 | ↓ | 2.14 | 24.3 |
| 2 | ↓ | 2.32 | 24.3 |
| 3 | ↓ | 2.41 | 24.3 |
| 4 | ↓ | 2.28 | 24.3 |
| 5 | ↓ | 2.27 | 24.3 |
| 6 | ↓ | 1.22 | 24.3 |
| 7 | ↓ | 0.14 | 24.2 |
| 8 | ↓ | 0.12 | 23.9 |
| 9 | ↓ | 0.12 | 23.9 |
| 10 | ↓ | 0.11 | 23.9 |
| 11 | ↓ | 0.12 | 23.9 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-27-07    Time: 7:15

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 3.47 | 24.5 |
| 1 | | 3.44 | 24.9 |
| 2 | | 3.49 | 24.9 |
| 3 | | 3.64 | 24.9 |
| 4 | | 3.59 | 24.9 |
| 5 | | 3.58 | 24.9 |
| 6 | | 3.54 | 24.9 |
| 7 | | 3.44 | 24.9 |
| 8 | | 3.45 | 24.9 |
| 9 | | 2.82 | 24.8 |
| 10 | | 1.19 | 24.4 |
| 11 | | 1.11 | 24.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

*Prairie du Sac Hydroelectric Project*
*2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-30-07 Time: 0715

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 8.16 | 26.3 |
| 1 | | 7.50 | 26.4 |
| 2 | | 7.80 | 26.4 |
| 3 | | 8.56 | 26.4 |
| 4 | | 8.99 | 26.4 |
| 5 | | 8.88 | 26.5 |
| 6 | | 8.70 | 26.5 |
| 7 | | 7.15 | 26.2 |
| 8 | | 7.44 | 26.3 |
| 9 | | 6.89 | 26.1 |
| 10 | | 6.10 | 26.0 |
| 11 | ↓ | 6.17 | 26.1 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

89° Yesterday
60° Now
92° Expected today

Clear

*Prairie du Sac Hydroelectric Project*
*2007 DO/Temp. Upstream Daily Profile Log*

Date: 7-31-07 Time: 0800

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature 70°F |
|---|---|---|---|
| Surface | | 7.25 | 26.0°C |
| 1 | | 6.98 | 26.2 |
| 2 | | 7.20 | 26.2 |
| 3 | | 7.65 | 26.3 |
| 4 | | 6.06 | 26.2 |
| 5 | | 5.89 | 26.1 |
| 6 | | 5.81 | 26.1 |
| 7 | | 5.63 | 26.1 |
| 8 | | 4.32 | 26.0 |
| 9 | | 3.88 | 25.8 |
| 10 | | 3.87 | 25.8 |
| 11 | | 3.82 | 25.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Date: 8-1-07 Time: 7:00

| Depth (meters) | Turbine Unit # | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | 2 | 4.16 | 25.7 |
| 1 | ↓ | 4.01 | 25.9 |
| 2 | | 4.04 | 25.9 |
| 3 | | 4.50 | 25.9 |
| 4 | | 4.48 | 25.9 |
| 5 | | 4.07 | 25.9 |
| 6 | | 2.99 | 25.9 |
| 7 | | 2.03 | 25.8 |
| 8 | | 2.04 | 25.7 |
| 9 | | 1.92 | 25.7 |
| 10 | | 1.87 | 25.7 |
| 11 | ↓ | 1.99 | 25.7 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Date: 8-2-07 Time: 0700

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 2.32 | 25.6 |
| 1 | | 2.13 | 25.7 |
| 2 | | 2.21 | 25.8 |
| 3 | | 2.17 | 25.8 |
| 4 | | 1.95 | 25.8 |
| 5 | | 1.69 | 25.8 |
| 6 | | 1.25 | 25.8 |
| 7 | | .16 | 25.7 |
| 8 | | .14 | 25.6 |
| 9 | | .14 | 25.6 |
| 10 | | .12 | 25.6 |
| 11 | ↓ | .12 | 25.6 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

95° Yesturday High
91° Expected Today
67° Now

Clear
3160 cfs

*Prairie du Sac Hydroelectric Project*
*2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-3-07 Time: 0645

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 309 | 25.7 |
| 1 | | 2.90 | 25.8 |
| 2 | | 3.05 | 25.8 |
| 3 | | 3.06 | 25.9 |
| 4 | | 2.89 | 25.9 |
| 5 | | 2.95 | 25.9 |
| 6 | | 2.87 | 25.9 |
| 7 | | 2.80 | 25.9 |
| 8 | | 2.80 | 25.9 |
| 9 | | 3.10 | 25.9 |
| 10 | | 3.18 | 25.9 |
| 11 | | 3.07 | 25.9 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

93° Yesterday
88° Today
59° Now

Clear
2820 cfs

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Date: 08-06-07 Time: 0930

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 3.10 | 25.2 |
| 1 | | 2.96 | 25.5 |
| 2 | | 3.19 | 25.6 |
| 3 | | 3.27 | 25.6 |
| 4 | | 3.41 | 25.6 |
| 5 | | 3.42 | 25.6 |
| 6 | | 3.38 | 25.6 |
| 7 | | 3.29 | 25.6 |
| 8 | | 3.38 | 25.6 |
| 9 | | 3.32 | 25.6 |
| 10 | | 3.38 | 25.6 |
| 11 | | 3.39 | 25.6 |
| 12 | | 3.40 | 25.6 |
| 13 | | 3.27 | 25.6 |
| 14 | | 3.30 | 25.6 |
| 15 | | 3.29 | 25.6 |

69°

cloudy
3150 CFS

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 08-08-07 Time: 0800

| Depth (meters) | Turbine Unit # | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | 2 | 3.31 | 25.5 |
| 1 | | 3.06 | 25.6 |
| 2 | | 3.11 | 25.6 |
| 3 | | 3.01 | 25.6 |
| 4 | | 3.34 | 25.6 |
| 5 | | 3.23 | 25.6 |
| 6 | | 2.95 | 25.6 |
| 7 | | 3.04 | 25.6 |
| 8 | | 3.06 | 25.6 |
| 9 | | 2.90 | 25.5 |
| 10 | | 3.10 | 25.6 |
| 11 | | 3.09 | 25.6 |
| 12 | | 3.00 | 25.6 |
| 13 | | 3.15 | 25.6 |
| 14 | | 3.16 | 25.6 |
| 15 | | 3.15 | 25.6 |

Temp 76°
units 2,6,7 Full load

Sunney
4720 CFS

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 08-09-07 Time: 1030

| Depth (meters) | Turbine Unit # | Dissolved Oxygen | Temperature |
|---|---|---|---|
| | 2 | | |
| Surface | | 7.45 | 26.3 |
| 1 | | 7.42 | 26.4 |
| 2 | | 7.60 | 26.4 |
| 3 | | 8.02 | 26.4 |
| 4 | | 8.41 | 26.4 |
| 5 | | 7.98 | 26.4 |
| 6 | | 7.62 | 26.4 |
| 7 | | 7.81 | 26.4 |
| 8 | | 7.77 | 26.4 |
| 9 | | 7.65 | 26.4 |
| 10 | | 7.67 | 26.4 |
| 11 | | 7.77 | 26.4 |
| 12 | | 7.71 | 26.4 |
| 13 | | 7.77 | 26.4 |
| 14 | | 7.75 | 26.4 |
| 15 | ✓ | 7.69 | 26.4 |

Temp. 76° overcast
Unit 2 Full CFS 2360
Unit 6 50%

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 08-10-07 Time: 0800

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 5.73 | 25.9 |
| 1 | | 5.69 | 26.0 |
| 2 | | 5.59 | 26.0 |
| 3 | | 5.85 | 26.0 |
| 4 | | 5.96 | 26.1 |
| 5 | | 6.09 | 26.0 |
| 6 | | 5.84 | 26.0 |
| 7 | | 5.44 | 26.0 |
| 8 | | 4.97 | 26.0 |
| 9 | | 4.89 | 26.0 |
| 10 | | 4.74 | 26.0 |
| 11 | | 3.85 | 25.9 |
| 12 | | 3.51 | 25.9 |
| 13 | | 3.43 | 25.9 |
| 14 | | 3.70 | 25.9 |
| 15 | ↓ | 4.69 | 26.0 |

Temp 77 Sunney and calm

unit 2 full unit 6 608 CFS 2540

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-13-07 Time: 1300 hrs

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 8.84 | 27.6 |
| 1 | | 8.45 | 27.7 |
| 2 | | 8.72 | 27.6 |
| 3 | | 9.02 | 27.7 |
| 4 | | 10.11 | 27.9 |
| 5 | | 9.75 | 27.9 |
| 6 | | 8.75 | 27.1 |
| 7 | | 6.32 | 27.1 |
| 8 | | 5.21 | 26.5 |
| 9 | | .62 | 25.8 |
| 10 | | .95 | 25.4 |
| 11 | | .12 | 25.5 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-14-07 Time: 0830

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 6.02 | 26.3 |
| 1 | | 6.00 | 26.5 |
| 2 | | 6.13 | 26.6 |
| 3 | | 6.22 | 26.6 |
| 4 | | 7.11 | 26.6 |
| 5 | | 6.95 | 26.6 |
| 6 | | 6.94 | 26.6 |
| 7 | | 6.57 | 26.6 |
| 8 | | 5.50 | 26.4 |
| 9 | | 5.44 | 26.5 |
| 10 | | 5.46 | 26.4 |
| 11 | | 5.65 | 26.5 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

**_Prairie du Sac Hydroelectric Project_**
**_2007 DO/Temp. Upstream Daily Profile Log_**

Date: 8-15-07 Time: 1100

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.41 | 26.0 |
| 1 | | 5.22 | 26.2 |
| 2 | | 5.41 | 26.3 |
| 3 | | 5.41 | 26.3 |
| 4 | | 5.82 | 26.3 |
| 5 | | 5.84 | 26.3 |
| 6 | | 5.87 | 26.3 |
| 7 | | 5.79 | 26.3 |
| 8 | | 5.70 | 26.3 |
| 9 | | 5.65 | 26.3 |
| 10 | | 5.72 | 26.3 |
| 11 | | 5.45 | 26.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-16-07 Time: 07:30

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 5.31 | 25.9 |
| 1 | | 5.00 | 25.9 |
| 2 | | 4.85 | 26 |
| 3 | | 5.01 | 26 |
| 4 | | 5.19 | 26.1 |
| 5 | | 5.09 | 26.1 |
| 6 | | 5.35 | 26.1 |
| 7 | | 5.54 | 26.1 |
| 8 | | 5.79 | 26 |
| 9 | | 5.75 | 26 |
| 10 | | 3.98 | 25.9 |
| 11 | ↓ | 3.33 | 25.9 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 8-17-07 Time: 0815

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 4.82 | 25.5 |
| 1 | | 4.48 | 25.7 |
| 2 | | 4.54 | 25.8 |
| 3 | | 4.83 | 25.8 |
| 4 | | 4.99 | 25.8 |
| 5 | | 4.95 | 25.8 |
| 6 | | 4.90 | 25.8 |
| 7 | | 4.90 | 25.8 |
| 8 | | 4.95 | 25.8 |
| 9 | | 4.90 | 25.8 |
| 10 | | 2.04 | 25.8 |
| 11 | | 2.67 | 25.7 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 8-20 Time: 8:30

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 4.71 | 23.6 |
| 1 | | 4.61 | 23.6 |
| 2 | | 4.61 | 23.6 |
| 3 | | 4.47 | 23.6 |
| 4 | | 4.77 | 23.6 |
| 5 | | 4.72 | 23.6 |
| 6 | | 4.73 | 23.6 |
| 7 | | 4.72 | 23.6 |
| 8 | | 4.79 | 23.6 |
| 9 | | 4.76 | 23.6 |
| 10 | | 4.75 | 23.6 |
| 11 | | 4.74 | 23.6 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. __Upstream__ Daily Profile Log*

Date: 9-21-07 Time: 7:45

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 4.64 | 22.8 |
| 1 | | 4.65 | 22.8 |
| 2 | | 4.58 | 22.8 |
| 3 | | 4.77 | 22.8 |
| 4 | | 4.77 | 22.8 |
| 5 | | 4.86 | 22.8 |
| 6 | | 4.89 | 22.8 |
| 7 | | 4.91 | 22.8 |
| 8 | | 4.95 | 22.8 |
| 9 | | 4.99 | 22.8 |
| 10 | | 4.98 | 22.7 |
| 11 | | 4.98 | 22.7 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-22-07 Time: 10:00

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 4.99 | 22.0 |
| 1 | | 5.14 | 22.0 |
| 2 | | 5.13 | 22.1 |
| 3 | | 5.36 | 22.0 |
| 4 | | 5.51 | 22.1 |
| 5 | | 5.38 | 22.0 |
| 6 | | 5.32 | 21.9 |
| 7 | | 5.23 | 21.9 |
| 8 | | 5.10 | 21.8 |
| 9 | | 5.11 | 21.8 |
| 10 | | 5.10 | 21.8 |
| 11 | | 5.09 | 21.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-23-07 Time: 7:00

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 7.02 | 22.5 |
| 1 | | 7.70 | 22.5 |
| 2 | | 7.21 | 22.5 |
| 3 | | 7.77 | 22.5 |
| 4 | | 7.87 | 22.4 |
| 5 | | 7.00 | 22.0 |
| 6 | | 6.65 | 21.7 |
| 7 | | 6.46 | 21.7 |
| 8 | | 5.36 | 21.2 |
| 9 | | 5.34 | 21.3 |
| 10 | | 5.55 | 21.3 |
| 11 | ↓ | 5.30 | 21.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 8-24-07 Time: 0710

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 9.13 | 22.6 |
| 1 | | 8.90 | 22.7 |
| 2 | | 9.35 | 22.7 |
| 3 | | 9.57 | 22.7 |
| 4 | | 9.54 | 22.7 |
| 5 | | 10.03 | 22.7 |
| 6 | | 9.44 | 22.6 |
| 7 | | 8.86 | 22.5 |
| 8 | | 7.86 | 21.8 |
| 9 | | 6.63 | 21.2 |
| 10 | | 6.33 | 21.0 |
| 11 | | 6.40 | 21.1 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

Cloudy
82° Yesterday High
81 Expected Today

.08 Precip

7670 cfs

Now 63°

15.98 Precip in 21 Days

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-27-07 Time: 0730

| Depth (meters) | Turbine Unit # #2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 10.76 | 22.3 |
| 1 | | 10.40 | 22.4 |
| 2 | | 10.68 | 22.4 |
| 3 | | 11.15 | 22.4 |
| 4 | | 11.71 | 22.5 |
| 5 | | 11.75 | 22.5 |
| 6 | | 11.53 | 22.3 |
| 7 | | 8.68 | 22.1 |
| 8 | | 7.47 | 21.9 |
| 9 | | 5.68 | 21.6 |
| 10 | | 5.36 | 21.6 |
| 11 | | 5.25 | 21.5 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

80° Yesterday High 9360 cfs
65° Now
Cloudy Expected Rain till Noon

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 8-28-07 Time: 07:30

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 9.04 | 22.3 |
| 1 | | 9.02 | 22.4 |
| 2 | | 9.13 | 22.4 |
| 3 | | 9.84 | 22.4 |
| 4 | | 9.83 | 22.4 |
| 5 | | 9.80 | 22.4 |
| 6 | | 9.36 | 22.4 |
| 7 | | 9.55 | 22.3 |
| 8 | | 9.33 | 22.3 |
| 9 | | 8.02 | 22.3 |
| 10 | | 5.44 | 21.9 |
| 11 | | 5.55 | 21.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

*Prairie du Sac Hydroelectric Project*
*2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-29-07 Time: 8:00

| **Depth (meters)** | **Turbine Unit #** 2 | **Dissolved Oxygen** | **Temperature** |
|---|---|---|---|
| Surface | | 8.64 | 23 |
| 1 | | 8.50 | 23 |
| 2 | | 8.36 | 23 |
| 3 | | 8.34 | 23 |
| 4 | | 8.77 | 23 |
| 5 | | 8.80 | 23 |
| 6 | | 8.80 | 23 |
| 7 | | 8.79 | 23 |
| 8 | | 8.56 | 22.8 |
| 9 | | 6.46 | 22.8 |
| 10 | | 7.11 | 22.5 |
| 11 | | 7.37 | 22.7 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 8-30-07 Time: 0725

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 7.83 | 22.8 |
| 1 | | 8.35 | 23.0 |
| 2 | | 8.42 | 23.0 |
| 3 | | 8.68 | 23.0 |
| 4 | | 8.81 | 23.0 |
| 5 | | 8.85 | 23.0 |
| 6 | | 8.82 | 23.0 |
| 7 | | 8.71 | 23.0 |
| 8 | | 8.92 | 22.9 |
| 9 | | 8.08 | 22.9 |
| 10 | | 8.41 | 22.9 |
| 11 | | 8.46 | 22.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

clear Expected today 78°
Yesterday 80°

8040 cfs

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 8-31-07 Time: 0705

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 8.46 | 22.8 |
| 1 | | 8.71 | 22.9 |
| 2 | | 8.24 | 22.9 |
| 3 | | 8.77 | 22.9 |
| 4 | | 9.52 | 22.9 |
| 5 | | 9.57 | 22.9 |
| 6 | | 9.44 | 22.9 |
| 7 | | 7.74 | 22.8 |
| 8 | | 7.41 | 22.7 |
| 9 | | 7.37 | 22.7 |
| 10 | | 7.19 | 22.7 |
| 11 | | 7.20 | 22.7 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

75° yesterday
53° Now
78° Expected today

8030 cfs

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 9-4-07 Time: 0815

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 10.81 | 23.6 |
| 1 | | 10.93 | 23.7 |
| 2 | | 11.10 | 23.8 |
| 3 | | 11.38 | 23.8 |
| 4 | | 11.57 | 23.7 |
| 5 | | 11.20 | 23.7 |
| 6 | | 8.97 | 23.4 |
| 7 | | 8.71 | 23.3 |
| 8 | | 8.49 | 23.3 |
| 9 | | 7.88 | 23.3 |
| 10 | | 7.82 | 23.2 |
| 11 | | 8.14 | 23.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

90° Yesterday
88° Expected Today
50° Low

6470 cfs
Clear

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Date: 9-6-07 Time: 0830

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | ↓ | 7.72 | 23.6 |
| 1 | | 7.48 | 23.6 |
| 2 | | 7.56 | 23.6 |
| 3 | | 7.78 | 23.6 |
| 4 | | 8.31 | 23.6 |
| 5 | | 7.91 | 23.6 |
| 6 | | 8.06 | 23.6 |
| 7 | | 4.97 | 23.6 |
| 8 | | 4.08 | 23.1 |
| 9 | | 2.44 | 22.9 |
| 10 | | 2.41 | 22.8 |
| 11 | ✓ | 2.50 | 22.9 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

CFS

71° overcast

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 09-02-07 Time: 0700

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 6.93 | 24.0 |
| 1 | | 6.85 | 24.0 |
| 2 | | 6.98 | 24.0 |
| 3 | | 7.10 | 24.0 |
| 4 | | 7.75 | 24.0 |
| 5 | | 7.81 | 24.1 |
| 6 | | 7.64 | 24.1 |
| 7 | | 6.55 | 23.9 |
| 8 | | 4.50 | 23.5 |
| 9 | | 4.02 | 23.3 |
| 10 | | 3.41 | 23.1 |
| 11 | | 3.46 | 23.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

67°

CFS 3230 Rance

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 9/11/07 Time: 0930

| Depth (meters) | Turbine Unit # #2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.58 | 22.7 |
| 1 | | 5.62 | 23.0 |
| 2 | | 5.82 | 23.1 |
| 3 | | 5.95 | 23.1 |
| 4 | | 5.91 | 23.1 |
| 5 | | 5.92 | 23.1 |
| 6 | | 6.00 | 23.0 |
| 7 | | 6.11 | 23.0 |
| 8 | | 6.07 | 23.0 |
| 9 | | 6.11 | 23.0 |
| 10 | | 6.18 | 23.0 |
| 11 | | 6.20 | 23.0 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. Upstream Daily Profile Log***

Date: 9/12/07 Time: 1030

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.88 | 21.9 |
| 1 | | 6.00 | 22.6 |
| 2 | | 6.00 | 22.6 |
| 3 | | 6.34 | 22.6 |
| 4 | | 5.66 | 22.4 |
| 5 | | 5.52 | 22.3 |
| 6 | | 5.54 | 22.3 |
| 7 | | 5.53 | 22.3 |
| 8 | | 5.60 | 22.3 |
| 9 | | 5.64 | 22.3 |
| 10 | | 5.61 | 22.3 |
| 11 | | 5.54 | 22.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## *Prairie du Sac Hydroelectric Project*
## *2007 DO/Temp. Upstream Daily Profile Log*

Date: 9/13/07 Time: 0830

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 5.86 | 21.6 |
| 1 | | 5.58 | 21.7 |
| 2 | | 5.81 | 21.9 |
| 3 | | 5.95 | 21.8 |
| 4 | | 6.12 | 21.8 |
| 5 | | 6.11 | 21.9 |
| 6 | | 6.03 | 21.9 |
| 7 | | 6.07 | 21.9 |
| 8 | | 6.07 | 21.8 |
| 9 | | 5.92 | 21.8 |
| 10 | | 5.88 | 21.8 |
| 11 | | 5.90 | 21.8 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

***Prairie du Sac Hydroelectric Project***
***2007 DO/Temp. <u>Upstream</u> Daily Profile Log***

Date: 9/14/07 Time: 0830

| Depth (meters) | Turbine Unit # 2 | Dissolved Oxygen | Temperature |
|---|---|---|---|
| Surface | | 6.50 | 21.1 |
| 1 | | 6.48 | 21.3 |
| 2 | | 6.23 | 21.3 |
| 3 | | 6.50 | 21.3 |
| 4 | | 6.66 | 21.3 |
| 5 | | 6.69 | 21.3 |
| 6 | | 6.67 | 21.4 |
| 7 | | 6.78 | 21.3 |
| 8 | | 6.81 | 21.3 |
| 9 | | 6.98 | 21.3 |
| 10 | | 7.00 | 21.3 |
| 11 | | 6.96 | 21.3 |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

# APPENDIX C

# FIELD SHEETS OF DOWNSTREAM MANUAL MEASUREMENTS

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 6-28-07 Time: 8:15

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 4 Water Temp. (°C) | Mid Unit # 4 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 24.6 | 4.78 | 24.8 | 3.49 | 23.2 | 2.57 |

Notes 63° SUNNY
3 UNITS RUNNING

Date: 6-29-07 Time:

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 4 Water Temp. (°C) | Mid Unit # 4 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 25°c | 6.29 | 24.8 | 5.56 | 24.7 | 5.31 |

Notes [illegible] SUNNY
63° 3 UNIT RUNNING

Date: 7-2-07 Time:

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 4 Water Temp. (°C) | Mid Unit # 4 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 25.4 | 5.77 | 25.4 | 5.34 | 23.6 | 4.15 |

Notes SUNNY

**Prairie du Sac Hydroelectric Project**
**2007 _Downstream_ Daily Dissolved Oxygen / Water Temperature Monitoring**

| Date: 7-3-07 | | | Time: 0800 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.8 | 5.26 | 24.7 | 5.98 | 24.6 | 4.10 |
| Notes | #2 Running | | | | | |

| Date: 7-5-07 | | | Time: 0740 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # | | Mid Unit # #2 | | Lock Side Unit # | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.8 | 4.51 | 24.7 | 3.19 | 24.6 | 3.02 |
| Notes | #2 only unit on line 1330 cfs | | | | | |

| Date: 7-6-07 | | | Time: 0845 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # | | Mid Unit # 2 | | Lock Side Unit # | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.6 | 3.73 | 24.5 | 2.55 | 24.3 | 1.95 |
| Notes | #2 Running | | | | | |

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 7/9/07 Time: 0830

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.6 | 4.76 | 25.6 | 4.84 | 25.2 | 3.30 |

Notes: Units 2, 6, 7 running Cloudy

Date: Time:

| Depth (m) | Shore Side Unit # | | Mid Unit # | | Lock Side Unit # | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | | | | | | |

Notes

Date: Time:

| Depth (m) | Shore Side Unit # | | Mid Unit # | | Lock Side Unit # | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | | | | | | |

Notes

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 7/12/07 Time: 0830

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 25.8 | 56.7 | 25.7 | 56.2 | 25.5 | 53.9 |

Notes: Sunny 68° 5.62
Gen #2 + 6 running

Date: 7/13/07 Time: 7:45

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 25.6 | 5.32 | 25.6 | 4.64 | 25.4 | 4.84 |

Notes: Sunny 62°
Gen #2, 6 + 7 running

Date: 7/16/07 Time: 0850

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 24.8 | 3.29 | 24.8 | 2.38 | 24.8 | 2.47 |

Notes: cloudy 64° units 2+6 running

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

| Date: 7-17-07 | | | Time: 7:45 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.4 | 3.87 | 24.3 | 2.76 | 24.2 | 1.85 |
| Notes | Gen #2 & 6 running<br>overcast and 70° | | | | | |

| Date: 7-18-07 | | | Time: 8:30 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 2 | | Mid Unit # 2 | | Lock Side Unit # 2 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.3 | 5.08 | 24.2 | 3.27 | 24.3 | 4.00 |
| Notes | 3 units running<br>Cloudy | | | | | |

| Date: 7-19-07 | | | Time: 0800 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.0 | 4.02 | 24.2 | 3.53 | 23.6 | 2.47 |
| Notes | Gen # 2 + 6 running<br>Sunny 70° | | | | | |

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 7-20-07 Time: 0800

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 24.4 | 5.35 | 24.4 | 5.07 | 22.4 | 3.61 |

Notes: Slight north wind 62° - clear
Gen # 1,6 + 7 running

Date: 7-23-07 Time: 08:30

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 24.4 | 4.29 | 24.2 | 3.25 | 24.1 | 3.18 |

Notes: Sunny
3 UNITS Running 2,627

Date: 7-24-07 Time: 0820

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 24.4 | 4.50 | 24.5 | 3.51 | 24.1 | 2.22 |

Notes: PT Cloudy #2 + 6 Running 2200 cfs

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 7-25-07    Time: 07:30

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.1 | 3.80 | 24.3 | 2.16 | 24.1 | 1.63 |

Notes: over cast 65°
2 units running

Date: 7-26-07    Time: 7:30

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.2 | 3.25 | 24.2 | 1.19 | 24.0 | 1.65 |

Notes: over cast
2 units running

Date: 7-27-07    Time: 9:20

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 24.9 | 4.61 | 24.8 | 3.43 | 24.7 | 3.16 |

Notes: Cloudy slight Rain
2 units Running

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 7-30-07 Time: 0735

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.9 | 5.50 | 26.0 | 6.27 | 25.6 | 4.66 |

Notes

Date: 7-31-07 Time: 0740

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.7 | 4.42 | 25.8 | 4.88 | 25.3 | 2.42 |

Notes Sunny 70° Gen #2 & 6 running

Date: 8-1-07 Time: 7:30

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.7 | 3.41 | 25.7 | 2.65 | 25.0 | 2.72 |

Notes

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

| Date: 8-2-07 | | | Time: 0715 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.7 | 3.05 | 25.6 | 1.12 | 25.5 | 1.39 |
| Notes | #2 + #6 Running Full LOAD 3160 cfs | | | | | |

| Date: 8-3-07 | | | Time: 0700 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.7 | 3.47 | 25.6 | 1.60 | 25.3 | 1.70 |
| Notes | #2 + #6 Running ~~Full Load~~ 2820 | | | | | |

| Date: 08-06-07 | | | Time: 0945 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.6 | 4.39 | 25.6 | 3.27 | 25.5 | 3.19 |
| Notes | 2+6 running Full load 3160CFS | | | | | |

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 08-08-07 Time: 0830

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.6 | 3.57 | 25.5 | 3.17 | 25.4 | 2.04 |

Notes: 2,6,7 Full load Sunney
Temp 76° 4720 CFS

Date: 08-09-07 Time: 1030

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 26.2 | 6.11 | 26.2 | 6.00 | 25.7 | 3.90 |

Notes: Temp 76° overcast
unit 2 Full unit 6 50% 2360 CFS

Date: 08-10-07 Time: 0800

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 25.8 | 4.71 | 25.7 | 4.08 | 25.3 | 2.31 |

Notes: Temp 77 Sunney and calm
unit 2 Full unit 6 60% 2540 CFS

**Prairie du Sac Hydroelectric Project**
**2007 _Downstream_ Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 8-13-07 Time: 1245

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 26.5 | 5.76 | 26.6 | 6.28 | 25.6 | 2.57 |

Notes # 2, 3+6 running Sunny

Date: 8-14-07 Time: 0830

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 26.4 | 5.47 | 26.3 | 4.85 | 25.8 | 2.63 |

Notes Pt Cloudy, 70°, 1.19 inches of rain last night
#2 running

Date: 8/15/07 Time: 1100

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 25.8 | 5.40 | 26.1 | 4.46 | 25.7 | 3.02 |

Notes Cloudy rained all morning NE wind #2 running

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 8-16-07 Time: 08:15

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 26 | 5.43 | 26.9 | 4.69 | 25.8 | 3.94 |

Notes: 2-UNITS RUNNING
Cloudy

Date: 8-17-07 Time: 0800

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 25.5 | 5.48 | 25.8 | 4.23 | 25.5 | 3.39 |

Notes: Gen #2 + 6 running, Clear 65°

Date: 8-20-07 Time: 850

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 6 Water Temp. (°C) | Lock Side Unit # 6 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 23.6 | 4.93 | 23.6 | 5.07 | 23.6 | 4.90 |

Notes:

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

| Date: 8-21-07 | | Time: 815 | | | |
|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 22.8 | 4.86 | 22.8 | 5.13 | 22.7 | 5.08 |
| Notes | 5 units on<br>Cloudy | | | | | |

| Date: 8-22-07 | | Time: 10:30 | | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 21.9 | 5.26 | 21.8 | 5.32 | 21.8 | 4.68 |
| Notes | Cloudy | | | | | |

| Date: 8-23-07 | | Time: 7:30 | | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 21.8 | 6.79 | 21.6 | 6.25 | 21.5 | 5.84 |
| Notes | 6 units running<br>Rain | | | | | |

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 8-24-07 Time: 0730

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 21.4 | 6.84 | 21.7 | 8.02 | 21.5 | 7.02 |

Notes: Not online #1 #2 + #8 on Line

Date: 8-27-07 Time: 0745

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 22.0 | 8.17 | 22.1 | 9.18 | 22.2 | 10.25 |

Notes: #1 off line ← Running →

Date: 8-28-07 Time: 9:00

| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
|---|---|---|---|---|---|---|
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 22.3 | 8.32 | 22.2 | 8.71 | 22.1 | 7.77 |

Notes: OVERCAST 5 UNITS running

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

| Date: 8-29-07 | | | Time: 8:30 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 22.8 | 7.46 | 22.7 | 8.05 | 22.5 | 7.05 |
| Notes: Cloudy & Rain | | | | | | |

| Date: 8-30-07 | | | Time: 0845 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 22.9 | 7.71 | 22.8 | 8.30 | 22.8 | 8.41 |
| Notes: #2 + #8 on line | | | | | | |

| Date: 8-31-07 | | | Time: 0725 | | | |
|---|---|---|---|---|---|---|
| | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| Depth (m) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 22.7 | 7.33 | 22.7 | 7.86 | 22.8 | 8.84 |
| Notes: #2 + #8 on line | | | | | | |

**Prairie du Sac Hydroelectric Project**
**2007 _Downstream_ Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 9-4-07 | Time: 0845

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 23.3 | 7.22 | 23.2 | 8.20 | 23.3 | 6.81 |

Notes: #1 + #8 off line #2 - ~~#8~~ on line

Date: 9-6-07 | Time: 0800

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # ~~0800~~ 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 23.2 | 5.70 | 23.3 | 5.77 | 23.1 | 4.12 |

Notes: #2 running Pt. Cloudy 71°

Date: 09-07-07 | Time: 0730

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 23.9 | 7.08 | 23.8 | 6.12 | 23.5 | 4.86 |

Notes: Rain 67° CFS 3230

**Prairie du Sac Hydroelectric Project**
**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

Date: 9/11/07 Time:

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 23° | 6.57 | 23.0 | 6.23 | 22.8 | 5.77 |

Notes: Pt Cloudy 62° # 2+7 running

Date: 9/12/07 Time: 1030

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 22.3 | 5.76 | 22.3 | 5.57 | 22.3 | 5.56 |

Notes: Clear 60° # 1,2,5,6+7 running

Date: 9/13/07 Time: 0830

| Depth (m) | Shore Side Unit # 1 Water Temp. (°C) | Shore Side Unit # 1 D.O. (ppm) | Mid Unit # 2 Water Temp. (°C) | Mid Unit # 2 D.O. (ppm) | Lock Side Unit # 8 Water Temp. (°C) | Lock Side Unit # 8 D.O. (ppm) |
|---|---|---|---|---|---|---|
| Mid-depth | 21.9 | 6.40 | 21.9 | 6.28 | 21.7 | 5.44 |

Notes: Clear 50° Gen 1,2,6+7 running

**Prairie du Sac Hydroelectric Project**

**2007 *Downstream* Daily Dissolved Oxygen / Water Temperature Monitoring**

| Date: 9/14/07 | | | Time: 0830 | | | |
|---|---|---|---|---|---|---|
| Depth (m) | Shore Side Unit # 1 | | Mid Unit # 2 | | Lock Side Unit # 8 | |
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | 21.4 | 7.12 | 21.3 | 6.98 | 21.3 | 6.40 |
| Notes | 47° Clear Units 1, 2, + 8 running | | | | | |

| Date: | | | Time: | | | |
|---|---|---|---|---|---|---|
| Depth (m) | Shore Side Unit # | | Mid Unit # | | Lock Side Unit # | |
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | | | | | | |
| Notes | | | | | | |

| Date: | | | Time: | | | |
|---|---|---|---|---|---|---|
| Depth (m) | Shore Side Unit # | | Mid Unit # | | Lock Side Unit # | |
| | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) | Water Temp. (°C) | D.O. (ppm) |
| Mid-depth | | | | | | |
| Notes | | | | | | |

Submission Contents